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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Masahiro MACHIDA et al.

On Appeal from Group: 2174

Application No.: 09/810,534

Examiner: P. KE

Filed: March 19, 2001

Docket No.: 108973

For: OPERATING METHOD AND DEVICE, AND IMAGE PROCESSING APPARATUS USING THE SAME

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is the Brief on Appeal in the above-identified application.

Also attached is Check No. 213589, in the amount of $540.00 ($270.00 Small Entity), in payment of the fee due under 37 C.F.R. 41.20(b)(2).

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Respectfully submitted,

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Date: December 24, 2008

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BRIEF ON APPEAL

Appeal from Group

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I. REAL PARTY INTEREST

The real party in interest for this appeal and the present application is Fuji Xerox Co., Ltd., by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 011628, Frame 0768.

II. STATEMENT OF RELATED CASES

There are no prior or pending appeals, interferences or judicial proceedings, known to any inventor, any attorney or agent who prepared or prosecuted this application or any other person who was substantively involved in the preparation or prosecution of this application, that may be related to, or that will directly affect or be directly affected by or have a bearing upon, the Board's decision in the pending appeal.

III. JURISDICTIONAL STATEMENT

The Board has jurisdiction under 35 U.S.C. §134(a). Appellants filed an Amendment on October 25, 2007. In response, the Examiner mailed a non-Final Rejection on June 25, 2008, setting a three-month shortened statutory period for response. The time for responding to the non-Final Rejection expired on September 25, 2008. Rule 134. A Notice of Appeal and a Petition for Extension of Time requesting a one-month extension of time under Rule 136(a) and a Pre-Appeal Brief Request for Review were filed on October 27, 2008. Because October 25, 2008 fell on a Saturday, October 27, 2008 was the effective expiration date for the one-month extension. Rule 7(a). A Notice of Panel decision was mailed on November 26, 2008. The time for filing an Appeal Brief expires the later of two months from the filing of the Notice of Appeal, or one month from the mailing date of the Notice of Panel Decision if a Pre-Appeal Brief Request for Review is sought. Bd.R. 41.37(c) and Official Gazette Notice, July 12, 2005. Therefore, the period for timely filing an Appeal Brief expires two month from the filing of the Notice of Appeal, which is December 27, 2008. However, because December 27, 2008 falls on a Saturday, December 29, 2008 is the effective expiration date for filing the Appeal Brief. Rule 136(a). This Appeal Brief is being timely filed on December 24, 2008.

IV. TABLE OF CONTENTS

V. TABLE OF AUTHORITIES

VI. STATUS OF AMENDMENTS

No Amendment has been filed in response to the non-Final Rejection. Therefore, the claims as amended by the entered October 25, 2007 Amendment are on appeal.

VII. GROUNDS OF REJECTION TO BE REVIEWED

The following grounds of rejection are presented for review:

1) Claims 1, 4-7, 10-14, 16-18 and 20-22 are rejected as having been obvious under 35 U.S.C. §103(a) over U.S. Patent No. 6,181,893 to Collard et al. (hereinafter "Collard") in view of U.S. Patent No. 6,115,720 to Bleizeffer et al. (hereinafter "Bleizeffer");

2) Claims 3 and 9 are rejected as having been obvious under 35 U.S.C. §103(a) over Collard in view of Bleizeffer, and further in view of U.S. Patent No. 5,543,857 to Wehmeyer et al. (hereinafter "Wehmeyer"); and

3) Claims 15 and 19 are rejected as having been obvious under 35 U.S.C. §103(a) over Collard in view of Bleizeffer, and further in view of U.S. Patent No. 5,751,953 to Shiels et al. (hereinafter "Shiels").

VIII. STATEMENT OF FACTS

1. In the rejection of independent claims 1, 7, 13, 14, 16, 18, 20 and 22 under 35 U.S.C. §103, the Examiner cites Collard (Fig. 4; col. 6, lines 45-65; col. 6, lines 35-46; col. 7, lines 20-50; col. 7, lines 10-20; col. 9, lines 25-40) and Bleizeffer (col. 2, lines 44-61; Fig. 18; col. 13, lines 15-55).

2. Collard discloses a layout of the display screen including "basic setting" (col. 7, lines 31-34; Fig. 4, element 60).

3. Bleizeffer describes to indicate completed steps of a task (Fig. 18; col. 2, lines 44-61).

4. The Examiner asserts that combination of Collard and Bleizeffer obviously disclose the features of independent claims 1, 7, 13, 14, 16, 18, 20 and 22 (June 25, 2008 Office Action, page 3, lines 16-18).

5. Appellants disagree with Fact #4.

6. Independent claims 1, 7, 13, 14, 16, 18, 20 and 22 each recite, *inter alia*, that (1) an item which has been already set, (2) an item which is being set along with parameters to choose from, and (3) an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another.

7. Collard is directed to a digital image reproduction apparatus (Abstract).

8. Bleizeffer is directed to a method and apparatus for assisting a user through installing a program in a computer workstation (Abstract).

9. Collard and Bleizeffer are not analogous to each other.

10. Bleizeffer does not disclose or suggest parameters to choose from.

11. In the rejection of dependent claims 3 and 9 under 35 U.S.C. §103, the Examiner cites Wehmeyer (Fig. 4, items "mute, "TV only," and "Stereo").

12. The Office Action asserts that combination of Collard, Bleizeffer and Wehmeyer disclose or suggest the features of claims 3 and 9.

13. Appellants disagree with Fact #12.

14. Wehmeyer discloses a television remote control unit in which a user can navigate a menu hierarchy until coming upon a desired command to be added to the menu (col. 2, lines 49-51).

15. In the rejection of dependent claims 15 and 19 under 35 U.S.C. §103, the Examiner cites Shiels (col. 7, lines 32-35).

16. The Office Action asserts that combination of Collard, Bleizeffer and Shiels disclose or suggest the features of claims 15 and 19.

17. Appellants disagree with Fact #16.

18. Shiels discloses entertainment systems in which the user can control the path of a narrative or plot lines (col. 1, lines 8-11).

IX. ARGUMENT

A. Claims 1, 4-7, 10-14, 16-18 and 20-22 Would Not Have Been Obvious Over Collard in View of Bleizeffer

The Office Action rejects claims 1, 4-7, 10-14, 16-18 and 20-22 under 35 U.S.C. §103(a) over U.S. Patent No. 6,181,893 to Collard et al. (hereinafter "Collard") in view of U.S. Patent No. 6,115,720 to Bleizeffer (hereinafter "Bleizeffer"). Appellants respectfully disagree and assert that a *prima facie* case of obviousness has not been established.

1. Claims 1, 7, 13, 14, 16, 18, 20 and 22 Are Patentable

Independent claims 1, 7, 13, 14, 16, 18, 20 and 22 each recite, *inter alia*, that (1) an item which has been already set, (2) an item which is being set along with parameters to choose from, and (3) an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another.

As shown in Appellants' Fig. 5, for example, the menu item button 126_1 displays a parameter display window 127_1 indicating a parameter that has already been set. The menu item button 126_2 displays a blank parameter display window 127_2 because the parameters for the button 126_2 is being set by the user. The menu item buttons 126_3-126_5 are indicated with dotted lines without any parameter display windows because the parameters have not yet been set by the user. Because each type of the parameters is displayed differently in the single frame, these are distinguishable from each other.

Therefore, the user can easily recognize which item has been set, which item is being set, and which item has not yet been set by the user.

The June 25, 2008 Office Action alleges that Collard discloses an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so that the item that is being set is distinguishable from the item which has been already set and the item which has not yet been set. Page 3, lines 9-12. The June 25, 2008 Office Action asserts that the "Basic Settings" shown in Fig. 4 of Collard are displayed differently from the rest of the items and correspond to the claimed feature. Page 3, lines 12-13.

The June 25, 2008 Office Action then concedes that Collard fails to teach that the item which has been already set is distinguishable from the item which has not yet been set, and asserts that Bleizeffer allegedly discloses this feature. Page 3, lines 16-21. Appellants respectfully disagree with these assertions.

a. Bleizeffer Not Analogous to Collard

Collard is directed to a digital image reproduction apparatus that has a display as shown in Fig. 4 for setting parameters. See the Abstract of Collard. In particular, Collard discloses in Fig. 4 a menu screen in which the user sets parameters for reproducing digital images. Collard merely discloses an item that is being set is displayed differently. Collard does not teach that (1) an item already set, (2) an item being set, and (3) an item not yet set are displayed in a

single frame and distinguishable from one anther. The Office Action acknowledges this (page 3, lines 14-15) and relies on Bleizeffer for admitted deficiencies. More specifically, the Office Action relies on col. 2, lines 44-61; Fig. 18; col. 13, lines 15-55 of Bleizeffer for this teaching. June 25, 2008 Office Action, page 3, lines 14-21.

However, Bleizeffer is directed to a method and apparatus for compensating for deficiencies existing in programs to assist a user through installing a program. See Abstract of Bleizeffer. Bleizeffer provides a solution to a problem in installing a complex program on mainframe computers where only little information is given as to the interrelationship between series of tasks to accomplish, the status of various subtasks which comprises the overall tasks, or the overall relationship of the various subtasks to each other and the task as a whole. See col. 1, lines 52-63 of Bleizeffer. Bleizeffer discloses that the tasks include load SPE libraries, install, migrate, fallback, remigrate and update. Col. 2, lines 46-47. Bleizeffer discloses that the user can determine which steps of a task have been completed by looking to see which step buttons have a highlighted boarder. Col. 2, lines 59-61.

Bleizeffer further discloses that Fig. 18 shows a standard job status window, entitled "Health Check Job Status," which contains jobs and information points, such as "Check integrity." Bliezeffer discloses that the reason for running the health check is that before a user migrates his/her DB2

system, or any other database system, it is wise to check on the health or status of the running of DB2 catalog and directory to ensure consistency and a lack of conflicts. Bleizeffer discloses that it is also wise to know of any changes in the product that could possibly affect any currently running application. Bleizeffer, col. 13, lines 21-29. Bleizeffer discloses that the Health Check view shown in Fig. 18 presents the user with a predefined job, which can be divided into smaller jobs. Bleizeffer, col. 13, lines 34-35.

Bleizeffer is not related to setting of item parameters or display thereof and is instead only concerned with displaying job status information of a program installation. Bleizeffer merely provides a user with information that steps of a task have been completed. See col. 2, lines 47-61 of Bleizeffer. Bleizeffer does not recognize a problem in, or provide a solution to, a problem in a menu screen of a digital image reproduction apparatus as taught by Collard during the item setting. Therefore, Bleizeffer and Collard are not in the same field of endeavor as they do not involve the same problems. As such, Bliezeffer is non-analogous to Collard.

Thus, those skilled in the art in the field of a menu screen of a digital image reproduction apparatus or item setting would not have looked to or considered the teaching of Bleizeffer as a solution to the problem in the menu screen. The Office Action fails to provide a reasonable rationale that would have led one of ordinary skill in the art to the non-analogous teachings of

Bleizeffer as required by *KSR v. Teleflex*, 550 U.S. 398 (2007). Accordingly, those skilled in the art would not have been motivated to combine Collard and Bleizeffer as alleged.

b. Combination Based on Impermissible Hindsight Knowledge

Bleizeffer only displays the completed tasks with text field and the incomplete tasks without the text field. Col. 2, lines 59-61 of Bleizeffer. Bleizeffer does not teach or suggest distinguishably displaying items being set along with parameters to choose from. In fact, Bleizeffer does not provide an option for the user to choose from. That is, Bleizeffer merely disclose the status of each task by "completed" or "incomplete." See. Fig. 18 of Bleizeffer. In addition, such indications of "completed" and "incomplete" are only the status of the tasks and not parameters of the tasks. In other words, "completed" and "incomplete" are not parameters that the user sets for each task.

Therefore, even if combined, Collard and Bleizeffer fail to reasonably teach or suggest display of 1) an item which has been already set, 2) an item which is being set along with parameters to choose from, and 3) an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another, as recited in independent claims 1, 7, 13, 14, 16, 18, 20 and 22.

Therefore, absent a sufficient rationale from the teachings themselves, the combination of Collard and Bleizeffer can only be a product based on

impermissible hindsight knowledge gained from Appellants' disclosure. This is improper. Moreover, even if combined, the combination fails to teach each and every claimed feature and the Office Action has failed to explain a rationale for the further modification or combination to resolve such deficiencies as required to support a *prima facie* case of obviousness.

At least for these reasons, Appellants respectfully submit that claims 1, 7, 13, 14, 16, 18, 20 and 22 are patentable over Collard and Bleizeffer.

2. Claims 4-6, 10-12, 17, 18 and 21 Are Patentable

Dependent claims 4-6, 10-12, 17, 18 and 21 are allowable at least for their dependence on the allowable base claims, as well as for the additional features they recite. Thus, withdrawal of the rejection is respectfully requested.

B. Claims 3, 9, 15 and 19 Would Not Have Been Obvious Over Collard in View of Bleizeffer, and Further in View of Wehmeyer or Shiels

The Office Action rejects claims 3 and 9 under 35 U.S.C. §103(a) over Collard in view of Bleizeffer and further in view of U.S. Patent No. 5,543,857 to Wehmeyer; and rejects claims 15 and 19 under 35 U.S.C. §103(a) over Collard in view of Bleizeffer and further in view of U.S. Patent No. 5,751,953 to Shiels. These rejections are respectfully traversed.

Wehmeyer discloses a "fetch" menu for a television receiver which can be customized by the user. See the Abstract of Wehmeyer. Shiels discloses

interactive entertainment systems in which the user is able to control directly or indirectly the path of a narrative or plot line. See the Abstract of Shiels.

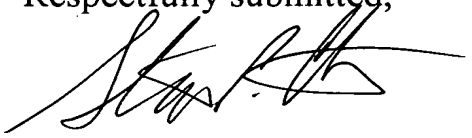
Neither Wehmeyer nor Shiels overcome the above-discussed deficiencies of Collard and Bleizeffer with respect to independent claims 1, 7, 14 and 18.

Therefore, claims 3, 9, 15 and 19 are allowable at least for their dependence to claims 1, 7, 14 and 18, respectively, as well as for the additional features they recite. Withdrawal of the rejection is respectfully requested.

C. Conclusion

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 1, 3-7 and 9-22 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections of the claims.

Respectfully submitted,



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X. APPENDIX A - CLAIMS SECTION

1. (Rejected) An operating method for sequentially performing settings for plural items in a predetermined order, the method comprising:

storing plural setting menu display data provided to the respective plural items;

displaying, in a single frame of a display device, the stored plural setting menu display data of plural items to be set;

allowing an operator to input an instruction to perform settings of the plural items through the display device; and

performing setting of the plural items in accordance with the inputted instruction; wherein

when setting of a first item which is being set is performed based on the inputted instruction, a setting menu display data of a second item that is next to the first item in the predetermined order is displayed, and the first item is displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another.

2. (Canceled)

3. (Rejected) The operating method as claimed in claim 1, wherein values which have been set are displayed for the item which has been already set.

4. (Rejected) The operating method as claimed in claim 1, wherein an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed.

5. (Rejected) The operating method as claimed in claim 4, wherein the setting frame for the item which has been already set is displayed, the setting for the item is carried out, and the setting frame being displayed is automatically restored to a previous setting frame which is displayed just before the setting frame for the item which has been already set is displayed.

6. (Rejected) The operating method as claimed in claim 5, wherein when the setting frame is restored to the previous setting frame, a state which has been just previously set is maintained.

7. (Rejected) An operating device for sequentially performing settings for plural items in a predetermined order, comprising:

a storage unit that stores plural setting menu display data provided to the respective plural items;

a display unit that displays, in a single frame, the stored plural setting menu display data of plural items to be set;

an input unit that inputs an instruction from an operator to perform settings of the plural items through the display device; and

a control unit that that performs setting of the plural items in accordance with the inputted instruction, wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting menu display data of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display so as to be distinguishable from one another.

8. (Canceled)

9. (Rejected) The operating device as claimed in claim 7, wherein values which have been already set are displayed for the item which has been already set.

10. (Rejected) The operating device as claimed in claim 7, wherein an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed.

11. (Rejected) The operating device as claimed in claim 7, wherein a setting frame for an item which has been already set is displayed, the setting for

the item is carried out, and the setting frame being displayed is automatically restored to a previous setting frame which is displayed just before the setting frame for the item which has been already set is displayed.

12. (Rejected) The operating method as claimed in claim 11, wherein when the setting frame is restored to the previous setting frame, a state which has been just previously set is maintained.

13. (Rejected) An image processing apparatus having an operating device for sequentially performing settings for plural items in a predetermined order, the image processing apparatus comprising:

a storage unit that stores plural setting menu display data provided to the respective plural items; and

a display unit that displays, in a single frame, the stored plural setting menu display data of plural items to be set;

an input unit that inputs an instruction from an operator to perform settings of the plural items through the display device; and

a control unit that performs setting of the plural items in accordance with the inputted instruction, wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting menu display data of a second item that is next to the first item in the predetermined order, and the first item is turned an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display so as to be distinguishable from one another.

14. (Rejected) An operating method for sequentially performing settings for plural items in a predetermined order to perform settings for a processor, the method comprising:

displaying, in a single frame of a display device, all of the plural items and one of plural setting menu display data of plural items to be set;

inputting an instruction from an operator to perform settings of the plural items through the display device;

setting the plural items in accordance with the inputted instruction;

carrying out a processing operation of the processor on the basis of contents set for the plural items; and

maintaining the contents set for the plural items; wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting menu display data of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set

are displayed in the single frame of the display device so as to be distinguishable from one another.

15. (Rejected) The operating method as claimed in claim 14, wherein after the processing operation of the processor is executed, an instruction can be provided as to whether the contents set for the plural items are maintained or the contents set are cleared.

16. (Rejected) An operating method for sequentially performing settings for plural items in a predetermined order to perform the setting for a processor, the method comprising:

enabling provision of instruction by a user for all the settings for the plural items to be initial settings;

setting the plural items in accordance with the provided instruction; and

displaying, in a single frame of a display device, all of the plural items and one of plural setting frames provided to the plural items, wherein

when setting of a first item which is being set is performed based on the inputted instructions, the display unit displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another.

17. (Rejected) The operating method as claimed in claim 16, wherein the instruction is provided on an initial frame.

18. (Rejected) An operating device for sequentially performing settings for plural items in a predetermined order to perform settings for a processor, the device comprising:

a holding unit that holds contents set for the plural items after the processing operation of the processor is carried out on the basis of the contents set for the plural items; and

a single frame of a display displaying all of the plural items and one of plural setting frames provided to the plural items, wherein

when setting of a first item which is being set is performed, a setting frame of a second item that is next to the first item in the predetermined order is displayed, and the first item is displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another.

19. (Rejected) The operating device as claimed in claim 18, further comprising:

an instructing unit that makes an instruction as to whether the contents set for the plural items are maintained or the contents set are cleared after the processing operation of the processor is executed.

20. (Rejected) An operating device for sequentially performing settings for plural items in a predetermined order to perform settings for a processor, the device comprising:

an instructing unit that instructs all the settings for the plural items to be initial settings based on a user command; and

a single frame of a display displaying all of the plural items and one of plural setting frames provided to the plural items, wherein

when setting of a first item which is being set is performed based on the user command, the single frame of the display displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another.

21. (Rejected) The operating device as claimed in claim 20, wherein the instructing unit is displayed on an initial frame.

22. (Rejected) An image processing apparatus having an operating device for sequentially performing settings for plural items in a predetermined order to perform the setting for a processor, the image processing apparatus comprising:

a holding unit that holds contents set for the plural items after the processing operation of the image processing apparatus is executed on the basis of the contents set for the plural items; and

a single frame of a display that displays all the plural items and one of plural setting frames provided to the plural items, wherein

when setting of a first item which is being set is performed based on the user command, the single frame of the display displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another.

XI. APPENDIX B - CLAIM SUPPORT AND DRAWING ANALYSIS SECTION

1. An operating method for sequentially performing settings for plural items in a predetermined order {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, the method comprising:

storing plural setting menu display data provided to the respective plural items {e.g., **Fig. 1, elements 46, 47, page 6, lines 41-43**};

displaying, in a single frame of a display device, the stored plural setting menu display data of plural items to be set {e.g., **Fig. 4, element 11, page 9, lines 21-22**};

allowing an operator to input an instruction to perform settings of the plural items through the display device {e.g., **page 10, lines 27-32**}; and

performing setting of the plural items in accordance with the inputted instruction {e.g., **page 10, lines 33-34**}; wherein

when setting of a first item which is being set is performed based on the inputted instruction, a setting menu display data of a second item that is next to the first item in the predetermined order is displayed, and the first item is displayed as an item which has been already set {e.g., **page 11, lines 5-8**}, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set

are displayed in the single frame of the display device so as to be distinguishable from one another {e.g., **Fig. 4, page 10, lines 7-26**}.

3. The operating method as claimed in claim 1, wherein values which have been set are displayed for the item which has been already set {e.g., **Fig. 5, element 127_1, page 11, lines 18-20**}.

7. An operating device {e.g., **Fig. 1, page 5, line 28-29**} for sequentially performing settings for plural items in a predetermined order {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, comprising:

a storage unit that stores plural setting menu display data provided to the respective plural items {e.g., **Fig. 1, elements 46, 47, page 6, lines 41-43**};

a display unit that displays, in a single frame, the stored plural setting menu display data of plural items to be set {e.g., **Fig. 2, element 1, page 5, lines 34-35; Fig. 4, element 11, page 9, lines 21-22**};

an input unit that inputs an instruction from an operator to perform settings of the plural items through the display device {e.g., **Fig. 2, element 3; page 5, lines 35-37; page 10, lines 27-32**}; and

a control unit that that performs setting of the plural items in accordance with the inputted instruction {e.g., **Fig. 1, element 40; page 5, line 45-page 6, line 6**}, wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting menu display data of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set {e.g., **page 11, lines 5-8**}, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display so as to be distinguishable from one another {e.g., **Fig. 4, page 10, lines 7-26**}.

9. The operating device as claimed in claim 7, wherein values which have been already set are displayed for the item which has been already set {e.g., **Fig. 5, element 127_1, page 11, lines 18-20**}.

13. An image processing apparatus {e.g., **Fig. 3, element CM; page 7, lines 6-9**} having an operating device {e.g., **Fig. 1, page 5, line 28-29**} for sequentially performing settings for plural items in a predetermined order {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, the image processing apparatus comprising:

a storage unit that stores plural setting menu display data provided to the respective plural items {e.g., **Fig. 1, elements 46, 47, page 6, lines 41-43**}; and

a display unit that displays, in a single frame, the stored plural setting menu display data of plural items to be set {e.g., **Fig. 2, element 1, page 5, lines 34-35; Fig. 4, element 11, page 9, lines 21-22**};

an input unit that inputs an instruction from an operator to perform settings of the plural items through the display device {e.g., **Fig. 2, element 3; page 5, lines 35-37; page 10, lines 27-32**}; and

a control unit that performs setting of the plural items in accordance with the inputted instruction {e.g., **Fig. 1, element 40; page 5, line 45-page 6, line 6**}, wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting menu display data of a second item that is next to the first item in the predetermined order, and the first item is turned an item which has been already set {e.g., **page 11, lines 5-8**}, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display so as to be distinguishable from one another {e.g., **Fig. 4, page 10, lines 7-26**}.

14. An operating method for sequentially performing settings for plural items in a predetermined order to perform settings for a processor {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, the method comprising:

displaying, in a single frame of a display device, all of the plural items and one of plural setting menu display data of plural items to be set {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**};

inputting an instruction from an operator to perform settings of the plural items through the display device {e.g., **page 10, lines 27-32**};

setting the plural items in accordance with the inputted instruction {e.g., **page 10, lines 33-34**};

carrying out a processing operation of the processor on the basis of contents set for the plural items {e.g., **page 13, lines 39-46**}; and

maintaining the contents set for the plural items {e.g., **page 20, 44-46**}; wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting menu display data of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set {e.g., **page 11, lines 5-8**}, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another {e.g., **Fig. 4, page 10, lines 7-26**}.

15. The operating method as claimed in claim 14, wherein after the processing operation of the processor is executed, an instruction can be provided as to whether the contents set for the plural items are maintained or the contents set are cleared {e.g., **Fig. 11, element 113; page 21, lines 6-8**}.

16. An operating method for sequentially performing settings for plural items in a predetermined order to perform the setting for a processor {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, the method comprising:

enabling provision of instruction by a user for all the settings for the plural items to be initial settings {e.g., **page 21, lines 2-5; Fig. 19, step S104**};

setting the plural items in accordance with the provided instruction {e.g., **page 10, lines 33-34**}; and

displaying, in a single frame of a display device, all of the plural items and one of plural setting frames provided to the plural items {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, wherein

when setting of a first item which is being set is performed based on the inputted instructions, the display unit displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set {e.g., **page 11, lines 5-8**}, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another {e.g., **Fig. 4, page 10, lines 7-26**}.

18. An operating device {e.g., **Fig. 1, page 5, line 28-29**} for sequentially performing settings for plural items in a predetermined order to perform settings for a processor {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, the device comprising:

a holding unit that holds contents set for the plural items after the processing operation of the processor is carried out on the basis of the contents set for the plural items {e.g., **Fig. 2, element 4b; page 6, lines 35-36**}; and

a single frame of a display displaying all of the plural items and one of plural setting frames provided to the plural items {e.g., **Fig. 4, element 11; page 9, lines 21-22**}, wherein

when setting of a first item which is being set is performed, a setting frame of a second item that is next to the first item in the predetermined order is displayed, and the first item is displayed as an item which has been already set {e.g., **page 11, lines 5-8**}, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set

are displayed in the single frame so as to be distinguishable from one another {e.g., **Fig. 4, page 10, lines 7-26**}.

20. An operating device {e.g., **Fig. 1, page 5, line 28-29**} for sequentially performing settings for plural items in a predetermined order to perform settings for a processor {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, the device comprising:

an instructing unit that instructs all the settings for the plural items to be initial settings based on a user command {e.g., **Fig. 1, element 43; page 6, lines 24-26**}; and

a single frame of a display displaying all of the plural items and one of plural setting frames provided to the plural items {e.g., **Fig. 4, element 11; page 9, lines 21-22**}, wherein

when setting of a first item which is being set is performed based on the user command, the single frame of the display displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set {e.g., **page 11, lines 5-8**}, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another {e.g., **Fig. 4, page 10, lines 7-26**}.

22. An image processing apparatus {e.g., **Fig. 3, element CM; page 7, lines 6-9**} having an operating device {e.g., **Fig. 1, page 5, line 28-29**} for sequentially performing settings for plural items in a predetermined order to perform the setting for a processor {e.g., **Fig. 4, elements 112a-112f, 116_1-116_5**}, the image processing apparatus comprising:

a holding unit that holds contents set for the plural items after the processing operation of the image processing apparatus is executed on the basis of the contents set for the plural items {e.g., **Fig. 2, element 4b; page 6, lines 35-36**}; and

a single frame of a display that displays all the plural items and one of plural setting frames provided to the plural items {e.g., **Fig. 4, element 11; page 9, lines 21-22**}, wherein

when setting of a first item which is being set is performed based on the user command, the single frame of the display displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is displayed as an item which has been already set {e.g., **page 11, lines 5-8**}, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another {e.g., **Fig. 4, page 10, lines 7-26**}.

XII. APPENDIX C - MEANS OR STEP PLUS FUNCTION ANALYSIS SECTION

NONE

XIII. APPENDIX D - EVIDENCE SECTION

A copy of each of the following items of evidence relied on by the Appellant and/or the Examiner in this appeal is attached:

Table of Contents

OPERATING METHOD AND DEVICE, AND IMAGE PROCESSING APPARATUS USING THE SAME

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to sequential setting type operating method and device, and an image processing apparatus using the same.

2. Description of the Related Art

As a sequential setting type (modal type) user interface has been known a menu operating system which is used in an apparatus for setting operating parameters such as the type of copy job processing, the sheet size, etc. in an image processing apparatus such as a copying machine or the like, ATMs (Automatic Teller Machines) of banks, ticket-vending machines of transit systems and various information terminals. In order for an operator to set plural parameters required to set the type of an operation to be performed and specify the operating condition thereof, a hierarchical menu having a hierarchical structure including plural setting menus is used in the above system (see Japanese Patent Laid-open No. Hei-9-114902).

Each setting menu contains setting items (parameter name, etc.) indicating parameters which the operator is allowed to set, and alternatives of the values of the parameters which can be set for the setting items. In the menu operating device, a setting display frame for each setting menu is created and displayed on a display device to indicate the information on the setting items and the parameter values to the operator. According to indications of the setting frames thus displayed, the operator sequentially inputs and sets the parameter value for each setting item. When the setting of all the parameter values required to carry out the processing operation is completed

for the setting menu of each layer contained in the hierarchical menu, the processing operation is started according to the processing type and the operating condition which are specified on the basis of each set parameter value.

In the sequential setting type menu operation using the hierarchical menu as described above, there is a case where an operator wants to alter or check some parameter values which have been set (hereinafter referred to as "set parameter values") by the operator in setting menus which have been already operated, thereby resetting parameter values. In this case, the operator sequentially turns the setting frame back from the current displayed setting frame one by one by using a one-frame turn-back button until the setting frame reaches a desired setting frame, or returns the setting frame to the initial setting (initialized) frame by using a initial return button and then turns the setting frame forwardly one by one until the setting frame reaches a desired setting frame.

In the case where the setting menu which has been already operated is re-operated as described above, particularly when the number of layers of the hierarchical structure of the setting menu is large, the number of operating steps required to return the setting frame to a desired setting frame for which the parameter values are to be altered or checked is increased. Further, the operator does not know any information on the number of setting menus and parameter values to be operated, the location of a setting menu being operated in the hierarchical structure of the overall hierarchical menu, etc. Therefore, the procedure of the various menu operations containing the alteration or check of the parameters is complicated, resulting in lowering of operability and also execution of an erroneous processing operation due to erroneous setting of parameters.

SUMMARY OF THE INVENTION

The present invention has been made in view of the above circumstances and provides operating method and device which can enhance the operability when plural items are sequentially set, and an image processing apparatus using the operating method and device.

According to a first aspect of the present invention, an operating method for sequentially performing settings for plural items in predetermined order includes the steps of sequentially displaying plural setting frames which are provided to the plural items respectively, and displaying the plural items when one of the plural setting frames is displayed.

According to a second aspect of the present invention, in the operating method of the first aspect, items which have been already set, items being set and items which have not yet been set are displayed so as to be distinguishable from one another.

According to a third aspect of the present invention, in the operating method of the first aspect of the present invention, values which have been set are displayed for the items which have been already set.

According to a fourth aspect of the present invention, in the operating method of the first aspect, an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed.

According to a fifth aspect of the present invention, in the operating method of the fourth aspect, a setting frame for an item which has been already set is displayed, and after the setting for the item is carried out, the setting frame is automatically restored to a setting frame displayed just before the setting frame for the item which

has been already set is displayed.

According to a sixth aspect of the present invention, in the operating method of the fifth aspect, when the setting frame is restored to the previous setting frame, a previously set state is held.

According to a seventh aspect of the present invention, an operating device for sequentially performing settings for plural items in predetermined order includes a storage unit for storing plural setting frames provided to the respective plural items, and a controller for displaying the plural items when one of the plural setting frames is displayed.

According to an eighth aspect of the present invention, in the operating device of the seventh aspect, items which have been already set, items being set and items which have not yet been set are displayed so as to be discriminable from one another.

According to a ninth aspect of the present invention, in the operating device of the seventh aspect of the present invention, values which have been set are displayed for the items which have been already set.

According to a tenth aspect of the present invention, in the operating device of the seventh aspect, an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed.

According to an eleventh aspect of the present invention, in the operating device of the seventh aspect, a setting frame for an item which has been already set is displayed, and after the settings for the items are carried out, the setting frame is automatically restored to a previous setting frame displayed before the setting frame for the items which have been already set is displayed.

According to a twelfth aspect of the present invention, in the operating

method of the fifth aspect, when the setting frame is restored to the previous setting frame, a previously set state is held.

According to a thirteenth aspect of the present invention, an image processing apparatus having an operating device for sequentially performing settings for plural items in predetermined order includes a storage unit for storing plural setting frames provided to the respective plural items, and a controller for displaying the plural items when one of the plural setting frames is displayed.

According to a fourteenth aspect of the present invention, in an operating method for sequentially performing settings for plural items in predetermined order to perform settings for a processor, after the processing operation of the processor is carried out on the basis of the contents set for the plural items, the contents set for the plural items are held.

It is preferable that when the contents set for the plural items are held after the processing operation of the processor is carried out, a processing start frame displayed after all the settings for the plural items are carried out is not used, but the setting frame is returned to the last setting frame to check the setting contents for the plural items.

Further, when the contents set for the plural items are held after the processing operation of the processor is executed, in order to enable alteration of some of the contents which have been already set, the setting frame is preferably returned to a setting frame for an item to be altered.

According to a fifteenth aspect of the present invention, in the operating method of the fourteenth aspect, after the processing operation of the processor is executed, it can be indicated whether the contents set for the plural items are held or the set contents are cleared.

According to a sixteenth aspect of the present invention, in an operating method for sequentially performing settings for plural items in predetermined order to perform the setting for a processor, an instructing unit for initializing all the settings for the plural items is allowed to be operated.

When the instructing unit for initializing all the settings for the plural items is operated, it is preferable to display a processing start frame which is a display frame to be displayed after all the settings for the plural items are executed. Further, in order to enable alteration from the initial setting to another setting for some of the plural items when the instructing unit for initializing all the settings for the plural items is operated, it is preferable to display each setting frame and enable re-setting.

According to a seventeenth aspect of the present invention, in the operating method of the sixteenth aspect, the instructing unit is displayed on an initial frame.

According to an eighteenth aspect of the present invention, an operating device for sequentially performing settings for plural items in predetermined order to perform settings for a processor includes a holding unit for holding the contents set for the plural items after the processing operation of the processor is carried out on the basis of the contents set for the plural items.

According to a nineteenth aspect of the present invention, the operating device of the eighteenth aspect includes an instructing unit for making an instruction as to whether the contents set for the plural items are held or the set contents are cleared after the processing operation of the processor is executed.

According to a twentieth aspect of the present invention, an operating device for sequentially performing settings for plural items in predetermined order to perform settings for a processor, includes an instructing unit for initializing all the settings for the plural items.

According to a twenty-first aspect of the present invention, in the operating device of the twentieth aspect, the instructing unit is displayed on an initial frame.

According to a twenty-second aspect of the present invention, an image processing apparatus having an operating device for sequentially performing settings for plural items in predetermined order to perform the setting for a processor includes a holding unit for holding the contents set for the plural items after the processing operation of the image processing apparatus is executed on the basis of the contents set for the plural items.

The operating method and the operating device of the present invention are applicable to not only an image processing apparatus such as a copying machine or the like, but also various processors such as ATMs (Automatic Teller Machines) of banks, ticket-vending machines of transit systems and various information terminals.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the present invention will be described in detail based on the following figures, wherein:

Fig. 1 is a block diagram showing the configuration of an embodiment of a menu operating device;

Fig. 2 is a block diagram showing a hardware configuration used for the menu operating device shown in Fig. 1;

Fig. 3 is a diagram showing the basic configuration of a copying machine which is an embodiment of an image processing apparatus to which the menu operating device is applied;

Fig. 4 is a diagram showing a configuration of a copy job type setting frame which is a first setting frame;

Fig. 5 is a diagram showing a configuration of a sheet size setting frame which is a second setting frame;

Fig. 6 is a diagram showing a configuration of a magnification setting frame which is a third setting frame;

Fig. 7 is a diagram showing a configuration of a number-of-copies setting frame which is a fourth setting frame;

Fig. 8 is a diagram showing a configuration of a processing start frame;

Fig. 9 is a diagram showing a configuration of a processing executing frame;

Fig. 10 is a diagram showing a configuration of a processing ending frame;

Fig. 11 is a diagram showing another configuration of the copy job type setting frame which is the first setting frame;

Fig. 12 is a diagram showing another configuration of the number-of-copies setting frame which is the fourth setting frame;

Fig. 13 is a diagram showing a configuration of a original type option setting frame;

Fig. 14 is a diagram showing another configuration of the number-of-copies setting frame which is the fourth setting frame;

Fig. 15 is a diagram showing another configuration of the copy job type setting frame which is the first setting frame;

Fig. 16 is a diagram showing another configuration of the copy job type setting frame which is the first setting frame;

Fig. 17 is a diagram showing another configuration of the sheet size setting frame which is the second setting frame;

Fig. 18 is a diagram showing another configuration of the magnification setting frame which is the third setting frame;

Fig. 19 is a flowchart showing a method of selecting set values or initial (default) values; and

Fig. 20 is a diagram showing another configuration of the processing executing frame.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments according to a menu operating method, a menu operating device and an image processing apparatus using the same in the present invention will be described hereunder with reference to the accompanying drawings. In the following description, the same elements are represented by the same reference numerals, and the duplicative description thereof is omitted. Further, the dimensional ratio of the elements in the figures is not necessarily coincident with that of the elements described in the following description.

Fig. 1 is a block diagram showing the configuration of an embodiment of a menu operating device according to the present invention.

The menu operating device uses a hierarchical menu which is constructed to have a hierarchical structure including plural setting menus. In the menu operating device, the setting menus of the respective layers in the hierarchical structure are sequentially operated along the hierarchical structure to sequentially set parameters for setting items required to execute a desired processing operation. The operating device is constructed to have a display device 1 for displaying a setting frame to operate a setting menu, a frame for a processing operation, etc., an input device 3 for operating a setting menu or instructing other operations while referring to the display content of the setting menu thus displayed or the like, and a menu operating controller 40 for controlling the menu operation using the above units.

A liquid crystal display or a CRT display is used as the display device 1, and the setting frame, etc. are displayed on the screen 10 of the display device 1. The input device 3 is equipped with a touch panel 3a which is mounted so as to face the screen 10 of the display device 1 as shown in Fig. 1. In addition to the tough panel 3a, a pointing device such as a mouse or the like or a keyboard or operating panel including ten keys and various instructing buttons may be used as the input device 3.

The menu operating controller 40 includes a display controller 41 for sequentially creating setting frames or other display frames (a processing start frame, a processing executing frame, a processing end frame, etc. as described later) and displaying these frames on the screen 10 of the display device 1, and a setting controller 42 for performing setting of parameters, etc. on the basis of the parameter values input from the touch panel 3a serving as the input device 3 and other operating instruction information.

The display controller 41 refers to menu data stored in a menu data storage unit 46 to create the setting frame corresponding to each setting menu, display frames for processing operations, etc. The menu data contain information on the setting item name (parameter name) of each setting menu, the hierarchical structure of the menu, the constructing method of each frame, and character data and image data required to create the setting frames, etc.

The setting controller 42 sets parameters for setting items in each setting menu by referring to the parameter data stored in the parameter data storage unit 47 if occasion demands. Further, the setting controller 42 may make an instruction to the display controller 41 about a setting menu to be next operated and a setting frame to be next displayed on the basis of the result of setting parameters. The parameter data contain information on the initial values of the parameters or data of default values.

However, these parameter data are not necessarily required to be referred to if the setting can be performed on the basis of only the parameter values input from the touch panel 3a (input device 3).

When the parameter setting is completed for all the setting items required to execute the processing operation, an instruction on the processing operation, for example, an instruction of indicating operating parameters or an instruction of starting execution of the processing operation is made to the processor through a processing operation instructing unit 43. The menu operating device thus constructed may be affixed to or contained as a part of the processor for executing the processing operation, which serves as a target to be subjected to the parameter setting based on the hierarchical menu.

Fig. 2 is a block diagram showing a hardware configuration used for the menu operating device shown in Fig. 1. The hardware control functions of the respective parts of the menu operating device and the software control functions such as menu display and operation based on the menu operating controller 40 are carried out by CPU 4. CPU 4 is connected to ROM 4a in which software programs, etc. required to execute the operation of the operating device are stored, and RAM 4b formed of DRAM or the like in which data are temporarily stored during execution of the programs.

The display device 1 for displaying each display frame such as the setting frame or the like and the input device 3 such as the touch panel 3a for inputting the parameter values according to a setting menu displayed on a setting frame are connected to CPU 4, ROM 4a and RAM 4b to thereby construct the menu operating device. Further, an external storage device 4c constructed by a single or plural storage devices such as hard discs or the like is used as the menu data storage unit 46 for

storing the menu data and the parameter data storage unit 47 for storing the parameter data.

Next, embodiments of the hierarchical menu, the setting menus contained in the hierarchical menu, and the display frames containing the setting frames which are created and displayed in association with the setting menu with respect to the menu operation method in the menu operating apparatus shown in Fig. 1 will be described. These embodiments will be described by using such a case that the menu operating apparatus is applied to an image processing apparatus, particularly a copying machine having a copying function or a composite machine having both of a copying function and other functions.

First, the configuration of a copying machine (or composite machine) which is an embodiment of the image processing apparatus will be schematically described. Fig. 3 shows the basic configuration of the copying machine to which the menu operating method and the menu operating device of the present invention are applied.

The copying machine CM shown in Fig. 3 is equipped with a main body 52, and an automatic original (source document) feeding unit 56 disposed so that a platen glass 54 mounted on the top face of the main body 52 is freely exposed to the outside and covered by the automatic original feeding unit 56. The platen glass 54, the automatic original feeding unit 56 and an original reading unit 58 constitute an image reading unit 50 for reading an image.

In the main body 52 are disposed the original reading unit 58 for reading an image of an original which is fed onto the platen glass 54 by the automatic original feeding unit 56 or an image of a fixed original which is mounted on the platen glass 54 by opening the automatic original feeding unit 56, and converting the image thus read to image data, an image forming unit 60 for forming a visible image on a recording

sheet (recording member) on the basis of the image data received from the image reading unit 50, and a sheet supply unit 62 for supplying a recording sheet to the image forming unit 60.

The image forming unit 60 is equipped with a photosensitive drum 64 (image carrier) rotating in a direction A (clockwise direction) of Fig. 3 and a transfer roll 65 rotating in a direction B (counterclockwise direction) of Fig. 3 so that the photosensitive drum 64 and the transfer roll 65 are proximate to each other at a transfer position P.

Around the photosensitive drum 64 are disposed an electrifying unit 66 for uniformly electrifying the photosensitive drum 64, a writing unit 68 for driving a laser beam or the like on the basis of the image data received from the image reading unit 50 to form an electrostatic latent image on the surface of the photosensitive drum 64, four developing units 70 each of which visualizes an electrostatic latent image formed on the photosensitive drum 64 with each of four color toner materials of yellow, magenta, cyan and black to form a developed image, and a cleaning unit 72 for removing residual toner on the photosensitive drum 64 after the developing image is transferred from the photosensitive drum 64 to the transfer roll 65 at the transfer position P.

In this embodiment, the four developing units 70 are mounted as described above, whereby the copying machine CM is constructed as an image processing apparatus which has a color copy function and can perform plural image forming types . The number of the developing units 70 used to form an image on a recording sheet is suitably determined on the basis of the number of toner materials being used in accordance with the image forming (copy job) type such as full color, white and black, monochromatic color or the like.

A transfer machine 74 for transferring a developing image formed with toner

on the surface of the photosensitive drum 64 onto a recording sheet which is supplied from the sheet supply unit 62 and fed into the gap between the photosensitive drum 64 and the transfer roll 65 is disposed inside the transfer roll 65 so as to face the transfer position P.

The image forming unit 60 is equipped with an image forming controller 75, and the electrifying unit 66, the writing unit 68 and the developing units 70 are controlled by the image forming controller 75 to control the amount of toner adhering onto the surface of the photosensitive drum 64. Further, the image forming unit 60 is equipped to a fixing unit 76 with which a developed toner image transferred to a recording sheet by the transfer machine 74 is fixed to the sheet.

The sheet supply unit 62 for supplying the sheet to the image forming unit 60 is disposed at the lower portion of the main body 52, and equipped with three sheet supply trays 78, 80, 82 each serving as a sheet supply unit, and a sheet supply mechanism 84 which is provided to each of the sheet supply trays 78, 80, 82. Recording sheets on which images will be formed are stacked in each of the sheet supply trays 78, 80, 82 while sorted in accordance with the sheet size or sheet type, and sequentially supplied to the transfer roll 65. Each sheet supply tray is detachably mounted in the main body 52, and a recording sheet is supplied from any one of these sheet supply trays.

Each sheet supply mechanism 84 includes a pickup roller 86 which abuts against the recording sheet located at the uppermost position in the sheet supply trays 78, 80, 82 and sequentially feeds the sheet out, and a feed roller 88 and a retard roller 90 which are paired rollers for receiving the sheet fed out from the pickup roller 86 and feeding out the sheet toward the image forming unit 60 while preventing overlapped sheets from being fed out. The pickup roller 86 and the feed roller 88 are rotated by a

motor (not shown), and the retard roller 90 paired with the feed roller 88 is rotationally driven by the rotation of the feed roller 88.

A recording sheet feeding path 94 is constructed by plural pairs of guide rollers 92 in a path extending from each sheet tray 78, 80, 82 toward the image forming unit 60. Recording sheets fed out from each sheet supply tray 78, 80, 82 are sequentially fed to the transfer position P and further the fixing unit 76 along the recording sheet feeding path 94, and then discharged to the outside through a discharge roller 96 disposed at the downstream side of the fixing unit 76 after the image forming process is carried out.

With respect to the image formation in the image forming unit 60, when an original is copied, the image formation is carried out on the basis of the image data from the image reading unit 50 as described above. When the image processing apparatus is a composite machine, the image forming unit 60 likewise forms an image on a recording sheet on the basis of image data from an external device such as a personal computer or the like which is connected to the image processing apparatus or image data read out from a recording medium such as a floppy disk or the like, in addition to image data from the image reading unit 50.

Next, an embodiment of the menu operating method when the menu operating device shown in Fig. 1 is applied to the copying machine or composite machine shown in Fig. 3 will be described. With respect to the mount position of the menu operating device, it may be affixed to the outside of the copying machine, however, it is preferable that the menu operating device is integrally mounted in the copying machine (not shown in Fig. 3). In this case, CPU 4, ROM 4a, RAM 4b, the external storage device 4c, etc constituting the menu operating controller 40, etc. are mounted as the menu operating controller at predetermined positions in the copying machine,

and the display unit 1 and the input device 3 such as the touch panel 3a are mounted as a part of the operating panel of the copying machine.

Here, in the following description on each display frame, the touch panel 3a is mounted on the screen 10 of the display device 1, and in association with this arrangement, each of portions which functions as an input portion used to select a setting menu or input a parameter in each display portion or display area on a display frame is expressed by "button", thereby discriminating these portions from those portions used to merely display information.

The hierarchical menu of this embodiment is used to set parameters of plural setting items on the processing type and operating condition of a copying operation which is a predetermined processing operation, and it is constructed by five setting menus of (1) a copy job type setting menu, (2) a sheet size setting menu, (3) a magnification setting menu, (4) a number-of-copies setting menu and (5) other setting menus.

These setting menus constitute the hierarchical menu for sequentially setting the parameters for the respective setting items by the hierarchical structure which is constructed in order from (1) to (5). The setting menu (1) is used for the processing type, and the setting menus (2) to (5) are used to set the operation conditions. This hierarchical menu is not designed in such a tree structure that the operating flow of setting menus is branched.

Fig. 4 is a diagram showing a copy job type setting frame 11 which is a first setting frame of this embodiment. The type setting frame 11 is designed to have a setting menu display area 110 which is located at the right side of the frame and displays the copy job type setting menu, and a hierarchical menu display area 115 which is located at the left side of the frame and displays the hierarchical structure of

the hierarchical menu constructed by five setting menus. At the upper left side of the frame (above the hierarchical menu display area 115) is disposed a reset button 119 for clearing and resetting the parameter values set for setting items in each setting menu.

The type setting menus to be operated on the type setting frame 11 are displayed in the setting menu display area 110. An instruction content display window 111 is provided at the upper portion of the setting menu display area 110, and "copy job type" which is the setting item name (parameter name) in this setting menu is displayed in the instruction content display window 111 to indicate selection of a parameter value to a user. Below the instruction content display window 111 are disposed six parameter input buttons 112a to 112f which indicate the choices of the parameter values settable for this setting item and with which the parameters are input through the touch panel 3a.

In the hierarchical menu display area 115 is displayed a list of five menu item buttons 116_1 to 116_5 corresponding to the setting menus of the five layers which contain the type setting menu displayed in the setting menu display area 110 in the type setting frame 11.

The setting item names "copy job type", "sheet size", "magnification", "number-of-copies" and "other settings" corresponding to the respective setting menus are displayed to indicate the association with the setting menus of the five layers on the menu item buttons 116_1 to 116_5. These five menu item buttons 116_1 to 116_5 are arranged from the upper side to the lower side of the frame in this order.

At this time, the menu item buttons 116_1 to 116_5 are displayed in such a listed arrangement that the setting menu corresponding to the menu item button 116_1 displayed at the uppermost position in the hierarchical menu display area 115 is set as the top-end type setting menu (the setting menu which is first operated) in the

hierarchical structure of the hierarchical menu, and the menu item buttons 116_2 to 116_5 corresponding to the lower setting menus (the setting menus which are subsequently operated) are displayed in the hierarchical order downwardly from the menu item button 116_1.

The "copy job type" menu item button 116_1 located at the first place (top) out of the menu item buttons 116_1 to 116_5 is displayed in the setting menu display area 110 on the setting frame 11, and it is the menu item corresponding to the type setting menu under operation (whose parameter is currently being set). Therefore, the menu item button 116_1 is displayed so that the right end portion thereof is connected to the setting menu display area 110 adjacent to the right side of the menu item button 116_1 as if it is displayed as a tag of the setting menu display area 110.

A parameter display window 117_1 for indicating a parameter value to be selected as a copy job type in the type setting menu is provided below the setting item name "copy job type" in the menu item button 116_1 being set. However, at the time when the type setting frame 11 is operated, no parameter value is displayed in the parameter display window 117_1 because a parameter value indicating the copy job type has not yet been set, and thus it indicates that the parameter setting is being carried out.

Further, the second to fifth menu item buttons 116_2 to 116_5 other than the menu item button 116_1 being set have not been operated until this time, and thus they are the menu items corresponding to the setting menus on which any parameter has not yet been set. Therefore, as indicated by dotted lines of Fig. 4, the non-set menu item buttons 116_2 to 116_5 are displayed in a display style different from that of the menu item button 116_1 being set. Further, no parameter display window is provided in each of the menu item buttons 116_2 to 116_5.

When any one of the parameter input buttons 112a to 112f for indicating

parameter values "full color", "white and black", "monochromatic color", "additional print of photograph", "copy of photograph" and "poster" which can be set for the setting item "copy job type" of the type setting menu, for example, the parameter input button 112a for selecting "full color" is pushed through the touch panel 3a in the type setting frame 11 (first setting frame) thus constructed, the parameter value corresponding to the parameter input button thus pushed is set as a parameter of "copy job type" in the setting controller 42 of the menu operating controller 40. In this case, a second setting frame is created in the display controller 41, and also the frame to be displayed on the display device 1 is shifted to the second setting frame.

Fig. 5 is a diagram showing the configuration of the sheet size setting frame 12 which is a second setting frame of this embodiment.

Like the type setting frame 11, the size setting frame 12 is designed to have a setting menu display area 120 which is located at the right side of the size setting frame 12 and displays a sheet size setting menu, and a hierarchical menu display area 125 which is located at the left side of the size setting frame and displays the hierarchical menu. A reset button 129 is disposed at the upper left side of the size setting frame.

A size setting menu to be operated in the size setting frame 12 is displayed in the setting menu display area 120. The internal configuration of the setting menu display area 120 is substantially the same as the setting menu display area 110 of the type setting frame 11, and a setting item name "sheet size" is displayed in an instruction content display window 121 to indicate selection of a parameter value. Further, six parameter input buttons 112a to 122f for inputting parameters are disposed below the instruction content display window 121.

Further, a list of five menu item buttons 126_1 to 126_5 is displayed in the

hierarchical menu display area 125. Of these buttons, a second button ("sheet size" menu item button 126_2) is displayed as the menu item button being set as if it is a tag connected to the setting menu display area 120. Further, the third to fifth lower menu item buttons 126_3 to 126_5 are displayed as non-set menu item buttons.

The first "copy job type" menu item button 126_1 has been already set on the upper setting frame 11, and it is the menu item corresponding to the setting menu on which parameters have been already set. Therefore, the menu item button 126_1 which has been already set is displayed in the same display style as the menu item button 126_2 being set. However, the menu item button 126_1 which has been already set is not connected to the setting menu display area 120 and displayed in the form of a normal button unlike the menu item button 126_2 being set.

Since no parameter has been set in the menu item button 126_2 being set, no parameter value is displayed in the parameter display window 127_2. On the other hand, in the menu item button 126_1 which has been already set, the parameter value "full color" set in the type setting menu is displayed in the parameter display window 127_1.

When any one of the parameter input buttons 122a to 122f for displaying the parameter values "A4", "A3", "B4", "B5", "postal card" and "thick paper" which can be set for the setting item "sheet size" of the size setting menu, for example, the parameter input button 122a for selecting "A4" is pushed on the size setting frame 12 (second setting frame) thus constructed, the parameter value corresponding to the parameter input button thus pushed is set as the parameter of "sheet size". Further, a third setting frame is created and the frame to be displayed is shifted to the third setting frame.

Fig. 6 is a diagram showing the configuration of a magnification setting frame 13 which is the third setting frame of this embodiment. Likewise the setting frames 11,

12, the magnification setting frame 13 includes a setting menu display area 130 which is located at the right side of the magnification setting frame 13 and displays a magnification setting menu, and a hierarchical menu display area 135 which is located at the left side of the magnification setting frame 13 and displays a hierarchical menu. A reset button 139 is disposed at the upper left portion of the magnification setting frame 13.

The magnification setting menu to be operated on the magnification setting frame 13 is displayed in the setting menu display area 130. A setting item name "magnification" is displayed in an instruction content display window 131 at the upper portion of the magnification setting frame 13 to indicate selection of parameter values. Further, five parameter input buttons 132a to 132e for inputting parameters are disposed below the instruction content display window 131.

Further, a list of five menu item buttons 136_1 to 136_5 is displayed in the hierarchical menu display area 135, and a third "magnification" menu item button 136_3 out of these buttons is displayed as a menu item button being set as if it is a tag connected to the setting menu display area 130. The lower fourth and fifth menu item buttons 136_4, 136_5 are displayed as non-set menu item buttons. The upper first and second menu item buttons 136_1, 136_2 are displayed as menu item buttons which have been already set, and the parameter values "full color" and "A4" set in the respective setting menus are displayed in the corresponding parameter display windows 137_1, 137_2.

When any one of the parameter input buttons 132a to 132e for displaying the parameter values "100% (X1 magnification)","reduction", "enlargement", "zoom", "slightly small" which can be set for the setting item "magnification" of the magnification setting menu, for example, the parameter input button 132a for selecting

"100%" is pushed in the magnification setting frame 13 (third setting frame) thus constructed, the parameter value corresponding to the parameter input button thus pushed is set as the parameter of "magnification". Further, a fourth setting frame is created and the frame to be displayed is shifted to the fourth setting frame.

Fig. 7 is a diagram showing the configuration of the number-of-copies setting frame 14 which is the fourth setting frame of this embodiment. Like the setting frames 11 to 13, the number-of-copies setting frame 14 includes a setting menu display area 140 which is located at the right side of the number-of-copies setting frame 14 and displays a number-of-copies setting menu, and a hierarchical menu display area 145 which is located at the left side of the frame 14 and displays a hierarchical menu. A reset button 149 is disposed at the upper left portion of the frame 14.

The number-of-copies setting menu to be operated on the number-of-copies setting frame 14 is displayed in the setting menu display area 140. A setting item name "number of copies" is displayed in an instruction content display window 141 at the upper portion of the frame 14 to indicate selection of a parameter value. Further, a parameter input button 142 is disposed below the instruction content display window 141.

The parameter input button 142 is kept in a selected state at all times on the number-of-copies setting frame 14, and a number-of-copies input portion 143 for allowing an operator to input the number of copies (parameter value) to be set is displayed at the right side of the frame 14 so as to be connected to the right end portion of the parameter input button 142. The number-of-copies input portion 143 contains a ten key portion 143a for inputting the number of copies, a number-of-copies display window 143b for displaying the number of copies thus input, and an enter button 144 for checking and determining the number of copies thus input.

Further, a list of five menu item buttons 146_1 to 146_5 is displayed in the hierarchical menu display area 145, and the fourth "number-of-copies" menu item button 146_4 out of these buttons is displayed as a menu item button being set as if it is a tag connected to the setting menu display area 140. The fifth lower menu item button 146_5 is displayed as a non-set menu item button. The first to third upper menu item buttons 146_1 to 146_3 are displayed as menu item buttons which have been already set, and the parameter values "full color", "A4" and "100%" set in the respective setting menus are displayed in the respective parameter display windows 147_1 to 147_3.

On the number-of-copies setting frame 14 (fourth setting frame) thus constructed, the number of copies which is a parameter value to be set, for example, "10" is input through the ten key portion 143a of the number-of-copies input portion 143 displayed so as to be connected to the parameter input button 142 for the setting item "number of copies" of the number-of-copies setting menu. When the number of copies thus input is checked on the basis of the display in the number-of-copies display window 143b and then an enter button 144 is pushed, the parameter value thus input is set as the parameter of "number of copies".

After the four hierarchical setting menus of (1) the copy job type setting menu, (2) the sheet size setting menu, (3) the magnification setting menu and (4) the number-of-copies setting menu are sequentially operated along the hierarchical structure of the hierarchical menu by using the respective setting frames 11 to 14, the setting of the parameters for the processing type and the operating condition which are required to execute the copying operation is finished. Thereafter, the processing start frame is created and the frame to be displayed is shifted to the processing start frame.

With respect to (5) the other setting menu, the setting items contained in this setting menu are not indispensable, and thus the description on the menu operation and

the parameter setting thereof is omitted from the description on the operational procedure which is now being made. The operation of this setting menu, etc. will be described later.

Fig. 8 is a diagram showing the configuration of the processing start frame 16 in this embodiment.

The processing start frame 16 has a similar configuration to the setting frames 11 to 14, and it includes an instructing menu display area 160 which is located at the right side of the frame 16 and displays an instructing menu for starting the execution of the copying operation, and a hierarchical menu display area 165 which is located at the left side of the frame 16 and displays a hierarchical menu. A reset button 169 is disposed at the upper left portion of the frame 16.

A processing start instructing menu to be operated on the processing start frame 16 is displayed in the instructing menu display area 160, and an instruction content on the instructing menu is displayed in an instruction content display window 161 located at the upper portion of the frame 16. Further, an instruction content such as a mount way of an original or the like is supplementarily displayed at the lower portion of the frame 16. In addition, a copy job start button 164 for instructing to start the execution of the copying operation which is a predetermined processing operation in the apparatus is disposed at the lower portion of the frame 16.

Further, a list of five menu item buttons 166_1 to 166_5 is displayed in a hierarchical menu display area 165. The lowest fifth menu item button 166_5 out of these buttons has not been subjected to the parameter setting for the setting item thereof as described above in the case of Fig. 8, and thus it is displayed as a non-set menu item button. On the other hand, the first to fourth menu item buttons 166_1 to 166_4 are displayed as menu item buttons which have been already set, and the parameter

values "full color", "A4", "100%" and "ten copies" set in the respective setting menus are displayed in the respective parameter display windows 167_1 to 167_4.

When the copy job start button 164 is pushed after it has been checked on the processing start frame 16 thus constructed that all the parameter values displayed in the parameter display windows 167_1 to 167_4 of the respective menu item buttons 166_1 to 166_4 within the hierarchical menu display area 165 are set to desired values, the execution of the copying operation is started on the basis of the processing type and the operating condition specified on the basis of the respective parameter values thus set. Further, a processing execution frame is created, and the frame to be displayed is shifted to the processing execution frame.

Fig. 9 is a diagram showing the configuration of the processing execution frame 17 in this embodiment.

The processing execution frame 17 is displayed during the execution of the copying operation after the setting of the parameter values on the setting frames 11 to 14 and the check of the parameter values on the processing start frame 16 are completed. Accordingly, the processing execution frame 17 is not provided with the hierarchical structure of the setting menus and the hierarchical menu display area in which the set parameter values are displayed, and only the instructing menu display area 170 and the instruction content display window 171 located above the instructing menu display area 170 are displayed on the processing execution frame 17.

The instructing menu display area 170 is provided with a processing type display window 172 for displaying the copy job type selected and executed in the copying operation being executed with pictures such as animation or the like, and a processing status display window 173 for displaying the current frequency of the copying operation (the current number of copies) which is being executed. Further, a

copy job stop button 174 for forcedly stopping the execution of the copying operation at some midpoint of the coping operation is displayed at the right side of the processing type display window 172. In Fig. 9, the processing execution frame 17 indicates that the number of copies set is 10 and the copying operation for the sixth copy is being executed.

Under the state that the above processing execution frame 17 is displayed, the execution of the copying operation is continued, and if the copying operation instructed is perfectly completed, the copying operation based on the respective parameter values set in the hierarchical menu is completed. Further, a processing end frame is created, and the frame to be displayed is shifted to the processing end frame.

Fig. 10 is a diagram showing the configuration of the processing end frame 18 in this embodiment.

Like the processing execution frame 17, the processing end frame 18 contains an instructing menu display area 180, and an instruction content display window 181 located above the instructing menu display area 180.

The instructing menu display area 180 is provided with an end instructing display window 182 for indicating the end of the copying operation or an instructing matter or the like after the copying operation is completed. Further, a continuous copy job button 183 for continuing the copying operation based on the same parameter values, and an enter button 184 for checking the end of the copying operation are disposed at the right side of the end instructing display window 182.

When the enter button 184 is pushed on the processing end frame 18, the copying operation is perfectly completed, and the parameter values set for the respective setting items are cleared. Therefore, in order to enable the start of the setting of parameters for a next copying operation, the frame to be displayed is shifted to the

copy job type setting frame 11 (first setting frame) again to wait for an input from the operator. The foregoing process is the operating procedure of the basic menu operating method in the menu operating device and the image processing apparatus of this embodiment.

Here, the setting menu selecting function (setting frame shifting function) of the menu item button displayed in the hierarchical menu display area will be described.

The menu operation is prohibited from being carried out on each of the five setting menus contained in the hierarchical menu due to the hierarchical structure of the menus if the parameter setting on any setting menu higher than the setting menu concerned has not yet been finished. For setting menus which have been already operated and thus on which parameters have been already set, there occurs such a case that any one of the setting menus which have been already set is required to be re-operated in order to alter or check the set parameter value thereof during the time period for which a setting menu lower than the setting menus is being operated.

According to the menu operating device and the image processing apparatus of this embodiment, in order to satisfy the above requirement for the setting menus on which the parameters have been already set, by referring to the menu item buttons which are displayed in the form of a list in the hierarchical menu display area, the setting frame which is being displayed and set at the time point can be directly returned to any desired one of the setting frames which have been already set.

That is, on the setting frames 12 to 14 other than the setting frame 11 corresponding to the uppermost setting menu in the hierarchical menu, the menu items corresponding to the setting menus (setting frames) higher than the setting menu being operated on any one of the setting frames 12 to 14 are displayed in the respective hierarchical menu display areas as menu item buttons which have been already set.

These menu item buttons which have been already set are allowed to function as setting menu selection buttons to select and return to desired setting menu and setting frame, whereby the setting frame being displayed can be directly returned to the setting frame corresponding to the desired setting menu to be re-operated.

Specifically, the menu item button 126_1 on the size setting frame 12 (Fig. 5), the menu item buttons 136_1, 136_2 on the magnification setting frame 13 (Fig. 6) and the menu item buttons 146_1 to 146_3 on the number-of-copies setting frame 14 (Fig. 7) can function as the setting menu selection buttons.

For example, when the menu item button 146_1 corresponding to the copy job type setting menu on the number-of-copies setting frame 14 under the state shown in Fig. 7 is pushed, the frame being displayed is returned to the type setting frame 11 while the parameter values which have been set on the setting menus "sheet size" and "magnification" are kept except for the selected "copy job type" setting menu.

Fig. 11 shows the state of the type setting frame 11 thus returned. Here, the menu item button 116_4 corresponding to the "number-of-copies" setting menu which was being operated before return is displayed as a non-set menu item button because the number-of-copies setting frame 14 is returned to the type setting frame 11 with the parameter thereof being left non-set.

The menu item button 116_1 is displayed as a menu item button being set (reset) as if it is a tap connected to the setting menu display area 110 as in the case of the menu item button being set in the case of the normal type setting frame 11 shown in Fig. 4. Here, the parameter value "full color" set before return is cleared to reset the parameter, and the parameter display window 117_1 is set to be non-set.

In Fig. 4, each of the menu item buttons 116_2 to 116_5 is displayed as a menu item button which is lower than the menu item buttons 116_1 being set and on which

any parameter has not yet been set. On the other hand, in Fig. 11, the "sheet size" menu item button 116_2 and the "magnification" menu item button 116_3 of the lower menu item buttons 116_2 to 116_5 correspond to those setting menus on which the parameters have been already set before return. Therefore, these menu item buttons 116_2 and 116_3 are displayed as menu item buttons which have been already set, and the parameter values "A4" and "100%" which have been set are displayed in the parameter display windows 117_2 and 117_3 thereof.

When the parameter input button 112b for selecting the parameter value "white and black" different from the parameter value "full color" set before the parameter is altered is pushed on the type setting frame 11, the "white and black" is reset as a parameter in the type setting menu. The frame to be displayed is automatically restored to the number-of-copies setting frame 14 which had been under setting before the frame was returned to the type setting frame 11. At this time, the number-of-copies setting frame 14 is set as shown in Fig. 12, and the parameter value displayed in the parameter display window 147_1 within the "copy job type" menu item button 146_1 is altered from "full color" to "white and black" (see Fig. 7).

On the number-of-copies setting frame 14 (Fig. 7) before the frame is returned to the type setting frame 11 shown in Fig. 11, the value corresponding to the number of copies which is a parameter to be set is input as 10 copies from the ten key portion 143a, and displayed in the number-of-copies display window 143b. However, since the enter button 144 is not pushed, the number of copies (10 copies) thus input is not set (settled) as the parameter.

If under this state the frame to be displayed is returned to the upper type setting frame 11 which has been set and the resetting of the parameter is carried out, it is preferable to keep the number of copies "10 copies" which has been input, but not

settled when the frame is returned to the number-of-copies setting frame 14 which was previously under setting after the resetting. In Fig. 12, the number of copies "10 copies" input is displayed in the number-of-copies display window 143b of the number-of-copies setting frame 14 at the time when the frame to be displayed is restored to the number-of-copies setting frame 14 because the parameter value thereof is held.

The non-set menu item buttons out of the menu item buttons do not function as the setting menu selection buttons to shift the display frame to the setting frame corresponding to the setting menu, and they serve as display portions for merely displaying menu items.

In the menu operating method, the menu operating device and the image processing apparatus of the above embodiments, the setting frames corresponding to the respective setting menus contained in the hierarchical menu are equipped with not only the setting menu display areas for displaying the setting items of the setting menus, the choices of the parameter values, etc., but also the hierarchical menu display areas. The plural menu item buttons corresponding to the setting menus (setting frames) of the respective layers are displayed with the hierarchical menu display area, and these menu item buttons are displayed as a list so as to be arranged in the vertical direction so that the higher (upper) menu item buttons in the hierarchical structure of the setting menus are located at the higher positions in the hierarchical menu display area.

At this time, the operator can get information on the hierarchical structure of the menus such as the number of layers, that is, the number of setting menus contained in the hierarchical structure, the order of the setting menus to be operated, etc. for the hierarchical menu for which the setting of the parameters to specify the processing

type and the operating condition of the copying operation is carried out. Further, upon viewing a location in a list display of the menu item button corresponding to a setting menu being operated, the operator can obtain the information as to the place at which the setting menu concerned is located in the hierarchical structure.

Accordingly, the operating procedure in the menu operating method and device using the hierarchical menu can be simplified. That is, for example when the operator wants to reset a parameter in a setting menu which has been already set, the operator can grasp the operating procedure for the resetting from the list display. Accordingly, the operability of the menu operation to set the parameters can be enhanced, and also occurrence of erroneous setting and erroneous operation by operators can be suppressed by simplifying the operating procedure.

Further, in the above embodiments, the menu item buttons which have been already set, the menu item buttons under setting, and the non-set menu item buttons which have not yet been set are displayed in different display styles for the parameter setting in each setting menu, whereby they are distinguishable from one another. Accordingly, the operation status of each setting menu or the setting status of the parameter at each time point can be checked from the list display of the menu item buttons.

By providing a parameter display portion to each of the menu item buttons which have been already set and displaying the parameter values which have been already set, the parameter values set in upper (higher) setting menus can be checked even when a lower setting menu is being operated. At this time, the operation of returning the setting frame being displayed to another frame is not required for the parameter checking operation in the re-operation of the setting menus which have been already set, and thus the operation is more simplified.

Further, each of menu item buttons which have been already set in the list of all the menu item buttons displayed is provided with the setting menu selecting function of returning the setting frame being displayed to the setting frame and the setting menu corresponding to any desired one of the menu item buttons which have been already set and to which the operator wants to return for the re-operation. In this case, when the operator wants to return to a setting frame to which the re-operation of the setting menu thereof is required, the operator checks the list display in the hierarchical menu display area to confirm the targeted setting frame, and then can directly return the setting frame being displayed to the desired (targeted) setting frame with the menu item button thereof.

Accordingly, the number of steps required for the resetting of the parameters can be reduced, and the operability of the hierarchical menu can be enhanced. In the above embodiments, the menu items (buttons) are used to perform a list display and select a desired setting menu, however, they may be used to perform a list display and merely check the setting menu. In this case, the setting frame being displayed may be returned to the desired setting frame (setting menu) by a setting menu selecting unit provided separately from the menu items (buttons) after the desired setting frame is confirmed from the list of the menu items. Further, there may be used an operating procedure of checking the number of layers to be turned from the list display until the setting frame being displayed is returned to the desired setting frame and pushing the one-frame turn-back button at the number of times corresponding to the number of layers thus checked.

By automatically restoring the desired setting menu to the setting menu being set again after the setting frame being displayed is returned to the desired setting frame (corresponding to a higher setting menu) by using the menu item button, the operating

procedure can be easily restored to the original operating procedure after the resetting is carried out. Further, it is not necessary to input the parameter again by keeping the parameter value being set when the setting frame is restored to the original setting frame, thereby further enhancing the menu operability.

However, after the re-operation of the setting menu on the setting frame thus restored is completed, the operator may manually shift the setting frame without automatically restoring the setting frame. In this case, if there is any setting menu which is lower than the setting menu thus re-operated and has been already set, the setting frame may be shifted by pushing the menu item button corresponding to the setting menu concerned or the like.

(5) The other setting menu out of the five setting menus is a setting menu to which the parameter setting is not necessarily required to execute the copying operation (hereinafter referred to as "option setting menu"). Therefore, the setting menu is set as the lowest (least significant) setting menu. It is not provided with the setting frames corresponding to the respective setting frames 11 to 14 for the other setting menus, and the execution of the copying operation can be carried out without operating this setting menu.

The other setting menu is constructed to contain plural option setting menus. In order to operate these option setting menus to optionally set parameters if occasion demands, four option setting buttons 152a to 152d are disposed in the setting menu display area 140 of the number-of-copies setting frame 14 as shown in Fig. 7. In this embodiment, four setting items "centering", "book erase", "type of original", "density" are provided as the option setting items for which the optional parameter setting can be carried out in the other setting menu.

These option setting items can be selected by the option setting buttons 152a

to 152d, respectively. By pushing any one of the option setting buttons 152a to 152d, the option setting menu for setting the parameter of the option setting item corresponding to the option setting button thus pushed is displayed on the option setting frame.

Fig. 13 is a diagram showing the configuration of the original type option setting frame 21 for operating the "type of original" option setting menu as an example of the option setting frame in this embodiment.

When the option setting button 152c for selecting the option setting item "type of original" is pushed in the number-of-copies setting frame 14, the frame to be displayed is shifted to the option setting frame 21. An option setting menu display area 210 and an instruction content display window 211 located at the upper side of the option setting menu display area are displayed on the option setting frame 21.

Further, an original type option setting menu to be operated on the option setting frame 21 is displayed in the option setting menu display area 210, and four parameter input buttons 212a to 212d for inputting parameters are disposed on the original type option setting menu. A setting cancel button 213 for cancel the optional setting and an enter button 214 for checking and settling the parameter value input are displayed at the lower right side of the parameter input buttons 212a to 212d.

Fig. 13 shows the state that the parameter input button 212c for selecting "photograph" out of the parameter values "character/photograph", "character", "photograph" and "map" settable for the setting item "type of original" of the original type option setting menu is pushed. The parameter input button 212c thus pushed is recognizable as being selected by making a button display style such as color or the like different from that before the button is selected (as indicated by a notched portion in Fig. 13). When the enter button 214 is pushed under the above state, "type of

original" is settled to "photograph", that is, "photograph" is optionally set as the parameter, and then the frame being displayed is restored to the number-of-copies setting frame 14 again.

When the parameter setting is carried out in the option setting menu contained in the other setting menu as described above, the option setting button 152c is displayed as being selected (notched) in the setting menu display area 140 on the number-of-copies setting frame 14 as shown in Fig. 14. Further, the fifth menu item button 146_5 corresponding to the other setting menu in the hierarchical menu display area 145 is displayed as a menu item button which has been already set, and the parameter value "photograph" set in the original type option setting menu is displayed in the parameter display window 147_5.

On the subsequent processing start frame 16 (see Fig. 8), the menu item button 165_5 is likewise displayed as a menu item button which has been already set, and the optionally-set parameter value "photograph" is displayed in the parameter display window thereof.

The option setting frame as shown in Fig. 13 is created in the same way for the other option setting items "centering", "book erase", "density" than "original type". When the option setting buttons 152a, 152b, 152d for selecting the corresponding setting items are pushed, the option setting frames corresponding to the respective option setting menus are displayed to perform the parameter option setting.

The parameter display window 147_5 displayed on the menu item button 146_5 of the number-of-copies setting frame 14 is partitioned into four sections in association with the four option setting items, and the parameter values which have been optionally set can be displayed on these sections. The same display arrangement is provided to the fifth "other settings" menu item button in each of the other setting

frames.

When the setting cancel button 213 located below the option setting menu display area 210 is pushed on the option setting frame 21, the setting frame being displayed is restored to the number-of-copies setting frame 14 shown in Fig. 7 under the state that no parameter is set to "type of original". The same is satisfied to the other option setting frames. Each option setting frame is not provided with any hierarchical menu display area as displayed in the setting frames 11 to 14, however, it may be provided with the same hierarchical menu as the normal setting frames, if necessary.

In the respective setting menus to be operated on the setting frames 11 to 14, some parameter input buttons displayed in the setting menu display area have sub menus for setting parameters more minutely. For example, the type setting menu of the type setting frame 11 (Fig. 4) has a "monochromatic color" input button 112c (see a sub menu display portion 114c shown in Fig. 15), an "additional print of photograph" input button 112d (see a sub menu display portion 114d shown in Fig. 16), a "photograph copy" input button 112e and a "poster" input button 112f as a sub menu.

Further, the size setting menu of the size setting frame 12 (Fig. 5) has an "postal card" input button 122e and a "thick paper" input button 122f (see a sub menu display portion 124f shown in Fig. 17) as a sub menu. The magnification setting menu of the magnification setting frame 13 (Fig. 6) has a "reduction" input button 132b, an "enlargement" input button 132c (see a sub menu display portion 134c shown in Fig. 18) and a "zoom" input button 132d as a sub menu.

These sub menus are used to minutely set parameters for indispensable setting items in the respective setting menu, and they are different from the option setting menus on option setting items which are not indispensable. Therefore, as show in Figs. 15 to 18, each of these sub menus is displayed at the right side of the setting menu

display areas 110, 120, 130 so as to be connected to the corresponding parameter input button while keeping the display contents in the other frame areas of the setting frames 11 to 13. The more minute parameter values can be input by using the parameter input buttons which are further displayed in each sub menu display portion. For example, the sub menu display portion 124f shown in Fig. 17 indicates the state that the "A4" input button has been pushed and selected as the parameter value for the size of thick paper and now "entering" is awaited.

Next, the operating procedures other than the above operating procedure in the menu operating method of this embodiment will be described in more detail.

First, selection of set values or initial values for the parameters in the respective setting items will be described.

There is a case where after a copying operation based on some parameter setting is completed, an operator wants to continue the copying operation with directly selecting the parameter value which has been already set (set value). According to the above embodiment, in order to support such a case (selection of a parameter value which has been already set), a continuous copy job button 183 is provided at the right side in the instructing menu display area 180 on the processing end frame 18 displayed after the copying operation is finished (see Fig. 10).

For example, "full color", "A4", "100%" and "10 copies" are set as the parameter values for the indispensable setting items "copy job type", "sheet size", "magnification" and "number of copies" respectively and then the copying operation is carried out. After the copying operation is finished, the processing end frame 18 is displayed.

At this time, on the processing end frame 18 are displayed not only the enter button 184 for clearing the parameter value set, but also the continuous copy job

button 183 for instructing continuous execution of a next copying operation by using the parameter value set. When the continuous copy job button 183 is pushed and the copying operation based on the set value is instructed again, the respective parameter values which have been already set are left as they are, and thus set as the parameter values for the respective setting items again in the setting controller 42 of the menu operating controller 40.

Under the state that these set parameter values are kept, the setting frame being displayed is shifted to the final setting frame of the plural setting frames, that is, the number-of-copies setting frame 14 (Fig. 7) corresponding to the display frame just before the processing start frame 16. Here, if it is not required to alter the respective parameter values from the set values, the enter button 144 is pushed to shift to the processing start frame 16 (Fig. 8), the copying operation based on the same set parameter values as the previous copying operation is allowed to be started again.

In addition to the case where the copying operation is continuously carried out with the parameter values which have been already set, there may occurs such a case that the most frequently used parameter values are set as initial values and the operator is allowed to select the setting based on these initial values. According to the above embodiment, in order to support such a case, an initial setting button 113 is provided at the right side in the setting menu display area 110 of the highest (most significant) type setting frame 11 corresponding to the copy job type setting menu (the first setting frame of the plural setting frames) (see Fig. 4).

For example, "full color", "A4", "100%" and "10 copies" are provided as the initial values of the parameter values for the indispensable setting items "copy job type", "sheet size", "magnification" and "number of copies". These initial values are automatically neither selected nor displayed.

At this time, the initial setting button 113 for instructing to carry out the copying operation on the basis of the parameter initial values which are provided in advance is displayed on the type setting frame 11 (first setting frame) in addition to the parameter input buttons 112a to 112f for setting the parameter values for the setting item "copy job type". When the initial setting button 113 is pushed to instruct the copying operation based on the initial values, in the setting controller 42 of the menu operating controller 40, the initial values of the respective parameters are selected as the parameter values and set as the parameter values for the respective setting items.

Under the state that the initial setting values are set as described above, the type setting frame 11 (first setting frame) is immediately shifted to the processing start frame 16 (Fig. 8) which is displayed after the overall setting of the parameters is completed, and the copying operation based on the initial values is allowed to be started.

Next, the method of selecting the set values or the initial values as described above will be described with reference to the flowchart based on the shift flow of each frame in Fig. 19. First, when the parameter setting for the copying operation is started on the first setting frame (step S101), it is instructed whether the initial values are selected for the parameters (S102).

If the parameter input button is pushed on the first setting frame, the subsequent setting frames are sequentially operated without selecting the initial values, and finally the final setting frame is displayed (S103). After the parameter setting on the final setting frame is completed, the setting frame being displayed is shifted to the processing start frame (S105), and the copying operation is allowed to be started. On the other hand, if the initial setting button is pushed on the first setting frame, the initial values are selected and set as the parameters (S104), and the setting frame being

displayed is immediately shifted to the processing start frame (S105).

When the copy job start button is pushed on the processing start frame, the copying operation is started and the processing execution frame is displayed (S106). Thereafter, the copying operation is finished and the processing end frame is displayed (S107).

Next, it is instructed whether the set values (the values which have been already set) are selected as the parameters to perform the copying operation again (S108).

If the enter button for the end of the processing is pushed on the processing end frame, the set values are not selected, but cleared (S109). Thereafter, the copying operation is finished and the processing waits for parameter setting for a next copying operation. On the other hand, if the continuous copy job button is pushed on the processing end frame, the set values are selected and held as the parameters (S110), and the setting frame being displayed is shifted to the final setting frame (S103).

By selecting the set values or the initial values as described above, the set values or the initial values can be set as parameters without operating each setting menu of the hierarchical menu, and thus the operating procedure can be simplified. Further, when the set values are selected, the setting frame being displayed is not directly returned to the processing start frame, but returned to the final setting frame. In this case, the operator is provided with an opportunity of checking the parameter values which have been already set, thereby preventing occurrence of erroneous operations due to erroneous set values. On the other hand, when the initial values are selected, the setting frame being displayed is shifted to the processing start frame. At this time, the operator can immediately instruct to start the processing operation, and thus the labor imposed on the operating procedure can be suppressed at maximum.

Even when the set values or initial values are selected as described above, by pushing each menu item button which has been already set on the number-of-copies setting frame 14 or the processing start frame 16, the setting frame being displayed is returned to the corresponding setting frame to alter some of the set values or initial values.

Next, the display of the copy job type on the processing execution frame will be described.

The processing execution frame 17 of this embodiment is provided with a processing type display window 172 in the instructing menu display area 170 thereof (see Fig. 9). The processing type display window 172 is used to display a processing type identifying image representing a selected one of plural types of image formation. During the execution of the copying operation, the animation corresponding to a copy job type (processing type) set on the type setting menu of the type setting frame 11 is displayed in the processing type display window 172. In Fig. 9, the copy job type during the copying operation being executed is set to "full color processing", and in association with the full color processing, an animation expressing that four color ink pieces are supplied to a sheet is displayed with a full color image.

By providing the processing execution frame 17 with the processing type display window 172 representing the processing type identifying image as described above, the operator can easily visually recognize the copy job type which is selected and executed in the copying operation. For example, when the operator recognizes the set copy job type as being incorrect on the basis of a displayed animation, he/she can immediately push the copy job stop button 174 displayed on the same processing execution frame 17 to forcedly stop the copying operation.

If the copy job type set is "white and black processing", an animation of a

white and black image expressing that only one color ink of black is supplied to a sheet is displayed in the processing type display window 172 as shown in Fig. 20. Further, if the copy job type set is "monochromatic color processing", an animation of a monochromatic color image expressing that the corresponding monochromatic color ink is supplied to a sheet is displayed in the processing type display window 172.

The menu operating method, the menu operating device and the image processing apparatus according to the present invention are not limited to the above-described embodiments, and various modifications may be made to these embodiments. Further, the display frames such as the setting frames, etc. to operate the setting menus are not limited to the configurations of the above-described embodiments, and various configurations may be used.

For example, in all the embodiments described above, each of the hierarchical menu display areas is located at the left side of the display frame, however, it may be located at any other place. With respect to the display style of the hierarchical structure of the menu items, various display styles such as numbering of the menu items, linkage of the menu items with arrows, etc. may be used. Further, with respect to the display style of the menu items for which the parameters have been already set, are being set and have not yet been set, they may be displayed in the same display style. Alternatively, the menu items are not displayed with character data, but they may be displayed with identifiable icon images.

Further, various hierarchical structures such as a hierarchical structure in which one setting menu is provided on each layer, such a tree structure which the setting menu is branched, etc. may be used as the hierarchical structure of the hierarchical menus. In the hierarchical menu display area may be displayed the overall operation flow of the hierarchical menu or a partial flow required at each time point.

Various modifications may be made to the operating procedure of each setting menu. For example, "100%" (corresponding to X1 magnification) is normally used for the third setting item "magnification" in the setting items of the five setting menus in the embodiment of the copying machine. Accordingly, it may be modified so that "100%" is set as the initial value of the parameter for only the magnification setting menu in advance, and after the setting of the sheet size on the sheet size setting frame is completed, the initial value of 100% is automatically set for "magnification" and then the setting frame being display is immediately shifted to the number-of-copies setting frame. However, even in this modification, if the "magnification" menu item button is pushed to return to the magnification setting frame, the magnification can be set to values other than 100%.

Further, with respect to "copy job type", when the parameter value "additional print of photograph" is selected or the like, the sheet size and the magnification are required to be fixed to the default values. In this case, it is preferable that the default values for "additional print of photograph" are automatically set for the sheet size and the magnification to prevent these data from being changed. With respect to the parameters which are unchangeable as described above, the parameter values thereof are displayed in a display style different from that of normal ones in the parameter display window within the menu item button, thereby indicating to the operator that these parameters are unchangeable.

In the operating method according to an aspect of the present invention, the operating device according to another aspect of the present invention and the image processing apparatus according to another aspect of the present invention, the setting on plural items is sequentially carried out in predetermined order, and the plural items are displayed when one of plural setting frames is displayed, whereby an operator can

obtain information as to the place at which the setting frame being displayed is located in the arrangement of the plural items to be sequentially set. Therefore, the operability an be enhanced.

In the operating method according to another aspect of the present invention and the operating device according to another aspect of the present invention, the items which have been already set, the items which are being set and the items which have not yet been set are displayed to be distinguishable from one another, so that these items can be discriminated from one another.

In the operating method according to another aspect of the present invention and the operating device according to another aspect of the present invention, set values are displayed for items which have been already set, so that the set values can be easily checked.

In the operating method according to another aspect of the present invention and the operating device according to another aspect of the present invention, when one of plural setting frames is displayed, an operation of displaying a setting frame on items which have been already set can be performed, so that the operator can reset these items which have been already set.

In the operating method according to another aspect and the operating device according to another aspect of the present invention, after a setting frame on items which have been already set is displayed and the setting on these items is carried out, the setting frame being displayed is automatically restored to a setting frame displayed before the setting frame on these items is displayed, so that the setting frame being currently displayed can be easily restored to the setting frame previously displayed.

In the operating method according to another aspect and the operating device according to another aspect of the present invention, when the setting frame being

displayed is restored to the previously displayed setting frame, the previously set state is maintained, so that the operation can be simplified.

In the operating method according to another aspect, the operating device according to another aspect and the image processing apparatus according to another aspect of the present invention, the operating method is a sequentially setting type operation method, and after the processing operation of the processor is executed on the basis of the content set on plural items, the contents set on the plural items are maintained, so that the operation can be simplified.

In the operating method according to another aspect and the operating device according to another aspect of the present invention, it can be instructed whether the contents set on the plural items are maintained or the contents thus set are cleared after the processing operation of the processor is executed, so that the operator is allowed to select one of the above choices, and the operability is enhanced.

In the operating method according to another aspect and the operating device according to another aspect of the present invention, the operating method is a sequentially setting type operation method, and an instructing unit for instructing all the settings on the plural items to initial settings is allowed to be operated, and thus the operability can be enhanced.

In the operating method according to another aspect and the operating device according to another aspect of the present invention, the instructing unit is displayed on the initial frame, and thus the operability can be enhanced.

The entire disclosure of Japanese Patent Applications Nos. 2000-84974 filed on March 24, 2000 and 2000-85025 filed on March 24, 2000 each including specification, claims, drawings and abstract are incorporated herein by reference in its entirety.

WHAT IS CLAIMED IS

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1. An operating method for sequentially performing settings for plural items in predetermined order, comprising the steps of:

sequentially displaying plural setting frames provided to the plural items, respectively; and

displaying the plural items when one of the plural setting frames is displayed.

2. The operating method as claimed in claim 1, wherein items which have been already set, items which are being set and items which have not yet been set are displayed so as to be distinguishable from one another.

3. The operating method as claimed in claim 1, wherein values which have been set are displayed for the items which have been already set.

4. The operating method as claimed in claim 1, wherein an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed.

5. The operating method as claimed in claim 4, wherein the setting frame for the item which has been already set is displayed, the setting for the item is carried out, and the setting frame being displayed is automatically restored to a previous setting frame which is displayed just before the setting frame for the item which has been already set is displayed.

6. The operating method as claimed in claim 5, wherein when the setting frame is

restored to the previous setting frame, a state which has been just previously set is maintained.

7. An operating device for sequentially performing settings for plural items in predetermined order, comprising:

a storage unit that stores plural setting frames provided to the respective plural items; and

a control unit that displays the plural items when one of the plural setting frames is displayed.

8. The operating device as claimed in claim 7, wherein items which have been already set, items which are being set and items which have not yet been set are displayed so as to be distinguishable from one another.

9. The operating device as claimed in claim 7, wherein values which have been already set are displayed for the items which have been already set.

10. The operating device as claimed in claim 7, wherein an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed.

11. The operating device as claimed in claim 7, wherein a setting frame for an item which has been already set is displayed, the setting for the item is carried out, and the setting frame being displayed is automatically restored to a previous setting frame which is displayed just before the setting frame for the item which has been already set

is displayed.

12. The operating method as claimed in claim 5, wherein when the setting frame is restored to the previous setting frame, a state which has been just previously set is maintained.

A1

13. An image processing apparatus having an operating device for sequentially performing settings for plural items in predetermined order, the image processing apparatus comprising:

a storage unit that stores plural setting frames provided to the respective plural items; and

a control unit that displays the plural items when one of the plural setting frames is displayed.

14. An operating method for sequentially performing settings for plural items in predetermined order to perform settings for a processor, the method comprising the steps of:

carrying out a processing operation of the processor on the basis of the contents set for the plural items; and

maintaining the contents set for the plural items.

15. The operating method as claimed in claim 14, wherein after the processing operation of the processor is executed, an instruction can be provided as to whether the contents set for the plural items are maintained or the contents set are cleared.

16. An operating method for sequentially performing settings for plural items in predetermined order to perform the setting for a processor, the method comprising:

enabling provision of instruction for all the settings for the plural items to be initial settings.

17. The operating method as claimed in claim 16, wherein the instruction is provided on an initial frame.

18. An operating device for sequentially performing settings for plural items in predetermined order to perform settings for a processor, the device comprising:

a holding unit that holds contents set for the plural items after the processing operation of the processor is carried out on the basis of the contents set for the plural items.

19. The operating device as claimed in claim 18, further comprising:

an instructing unit that makes an instruction as to whether the contents set for the plural items are maintained or the contents set are cleared after the processing operation of the processor is executed.

20. An operating device for sequentially performing settings for plural items in predetermined order to perform settings for a processor, the device comprising:

an instructing unit that instructs all the settings for the plural items to be initial settings.

21. The operating device as claimed in claim 20, wherein the instructing unit is

displayed on an initial frame.

22. An image processing apparatus having an operating device for sequentially performing settings for plural items in predetermined order to perform the setting for a processor, the image processing apparatus comprising:

a holding unit that holds contents set for the plural items after the processing operation of the image processing apparatus is executed on the basis of the contents set for the plural items.

ABSTRACT OF THE DISCLOSURE

In menu operating method and device and an image processing apparatus using the same, a setting frame for operating a setting menu is constructed by a setting menu display area and a hierarchical menu display area. A setting menu to be operated is displayed in the setting menu display area, and menu item buttons corresponding to setting menus on respective layers contained in a hierarchical menu are displayed in a listing style according to its hierarchical structure in the hierarchical menu display area. At this time, an operator can obtain information such as the hierarchical structure of menus and the position of a setting menu being operated on each setting frame, and the operability of the hierarchical menu is enhanced.

FIG. 1

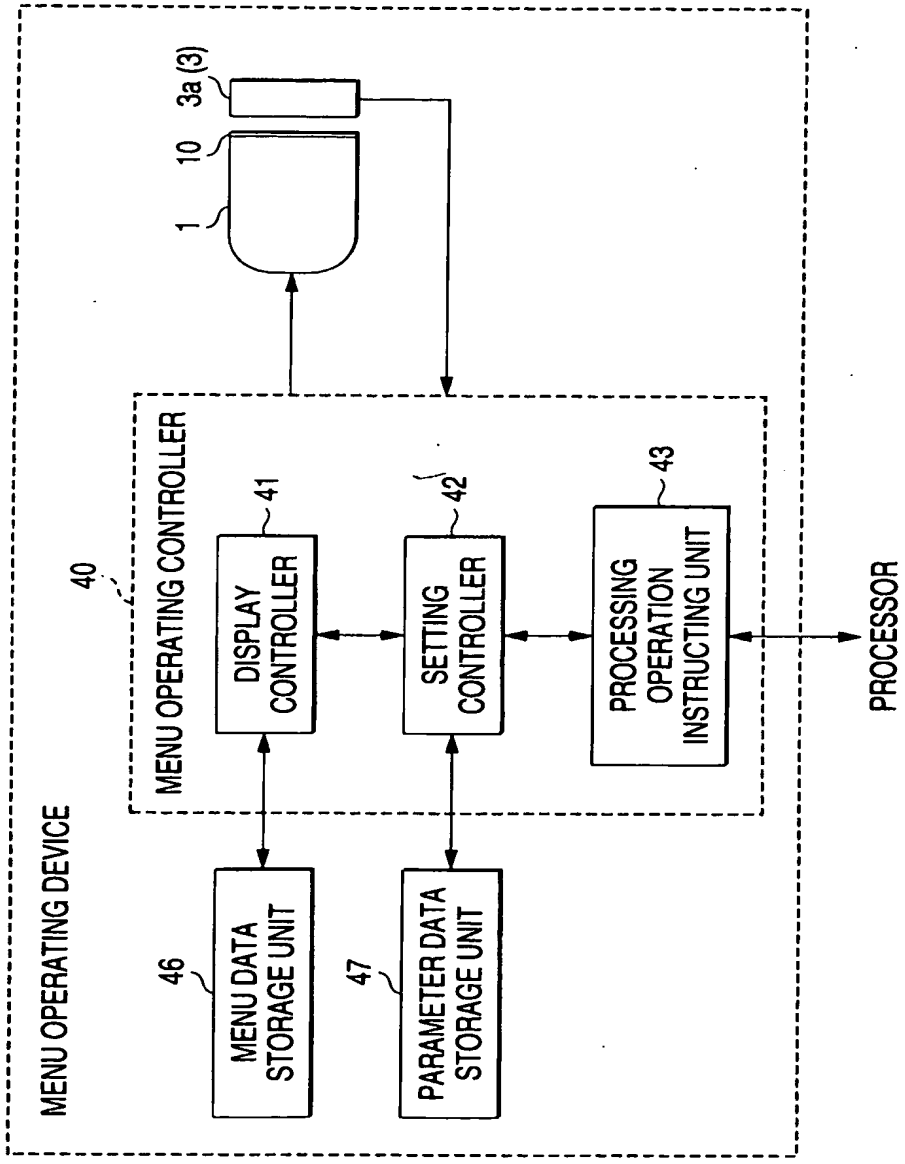

MENU OPERATING DEVICE
MENU OPERATING CONTROLLER
40
DISPLAY CONTROLLER
41
SETTING CONTROLLER
42
PROCESSING OPERATION INSTRUCTING UNIT
43
PROCESSOR
MENU DATA STORAGE UNIT
46
PARAMETER DATA STORAGE UNIT
47
1
10
3a (3)

FIG. 2

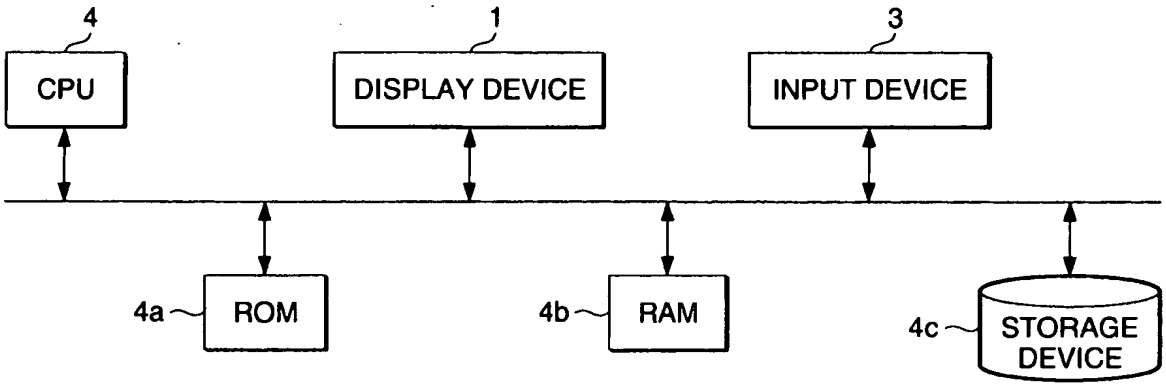

4
CPU
1
DISPLAY DEVICE
3
INPUT DEVICE
4a
ROM
4b
RAM
4c
STORAGE DEVICE

FIG. 3

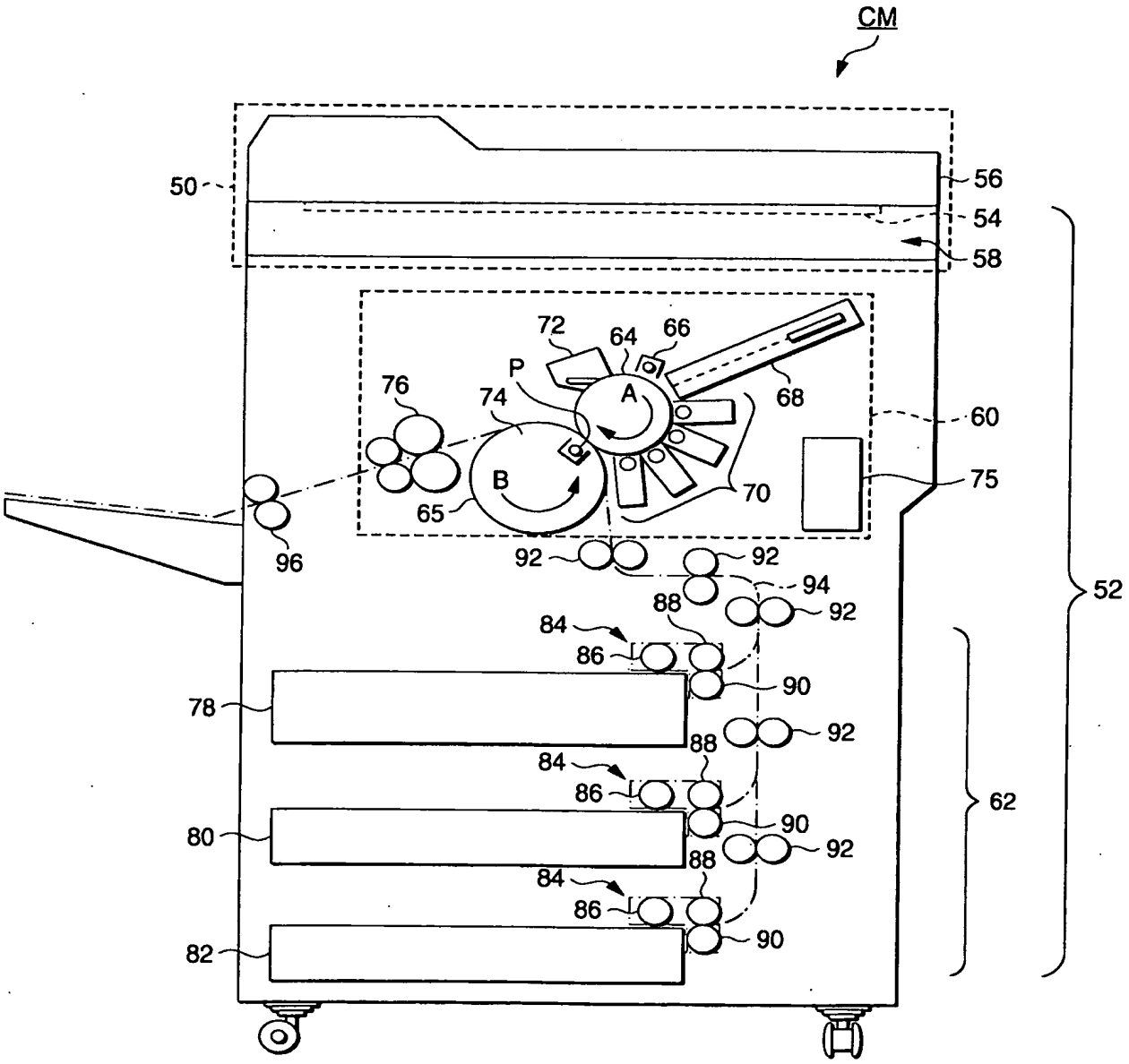

CM
50
56
54
58
72
64
66
P
A
68
76
74
60
B
65
70
75
96
92
92
94
88
92
84
86
90
78
92
88
84
86
90
80
92
88
84
86
82
90
52
62

FIG. 4

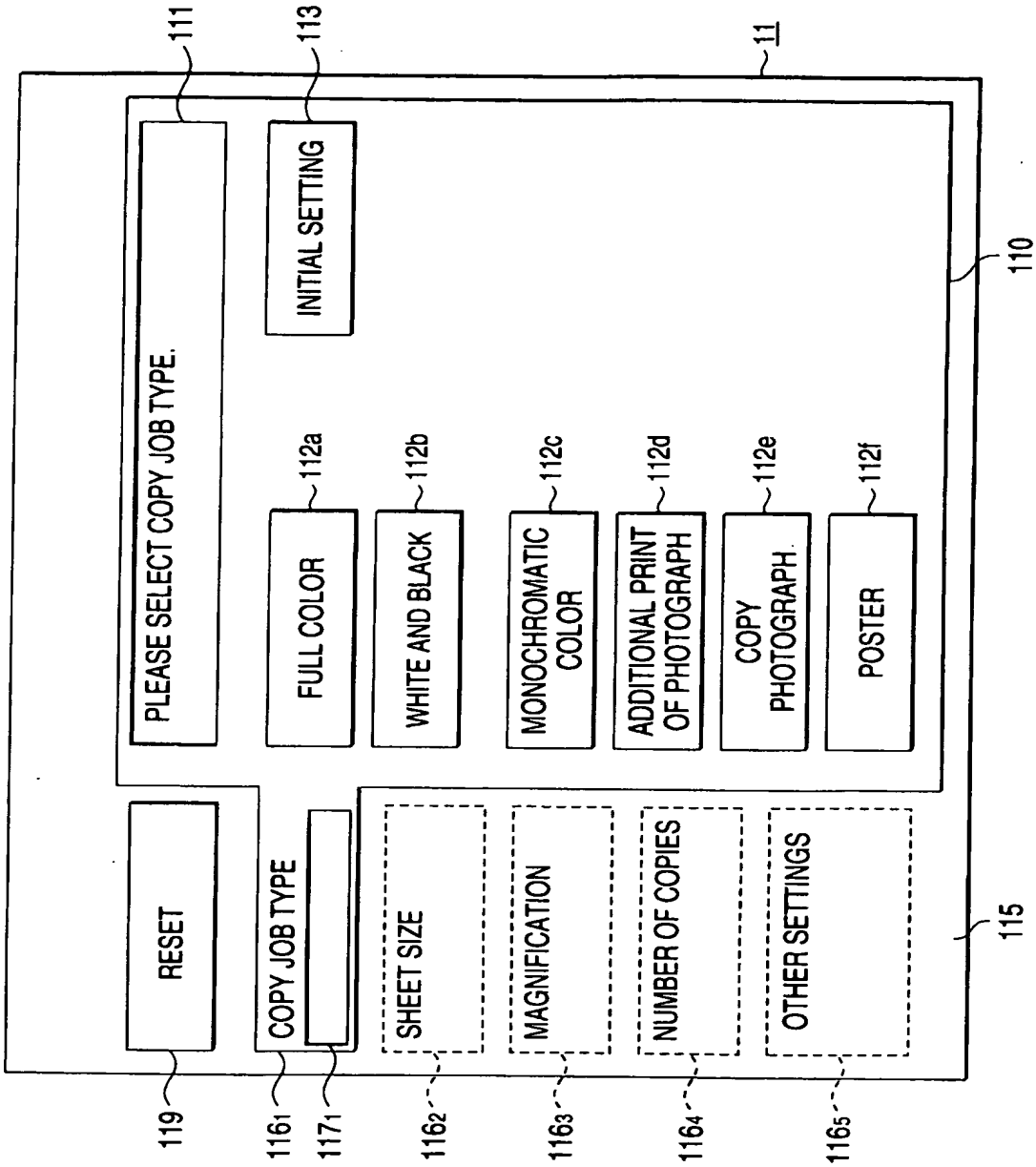

111
113
11
PLEASE SELECT COPY JOB TYPE.
INITIAL SETTING
110
112a
112b
112c
112d
112e
112f
FULL COLOR
WHITE AND BLACK
MONOCHROMATIC COLOR
ADDITIONAL PRINT OF PHOTOGRAPH
COPY PHOTOGRAPH
POSTER
RESET
COPY JOB TYPE
SHEET SIZE
MAGNIFICATION
NUMBER OF COPIES
OTHER SETTINGS
115
119
116₁
117₁
116₂
116₃
116₄
116₅

FIG. 5

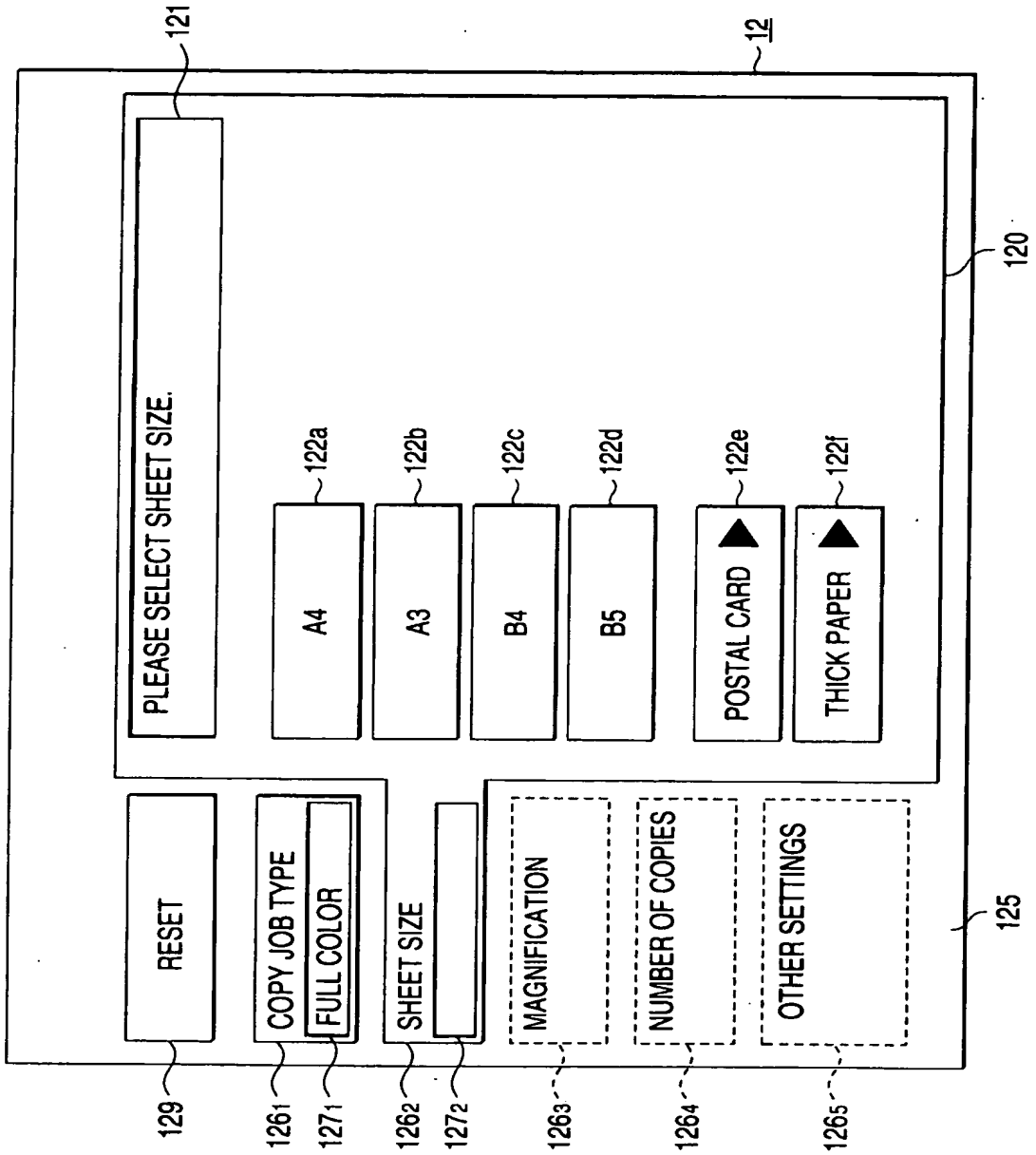

121
12
120
PLEASE SELECT SHEET SIZE.
122a
122b
122c
122d
122e
122f
A4
A3
B4
B5
POSTAL CARD
THICK PAPER
RESET
COPY JOB TYPE
FULL COLOR
SHEET SIZE
MAGNIFICATION
NUMBER OF COPIES
OTHER SETTINGS
125
129
126₁
127₁
126₂
127₂
126₃
126₄
126₅

FIG. 6

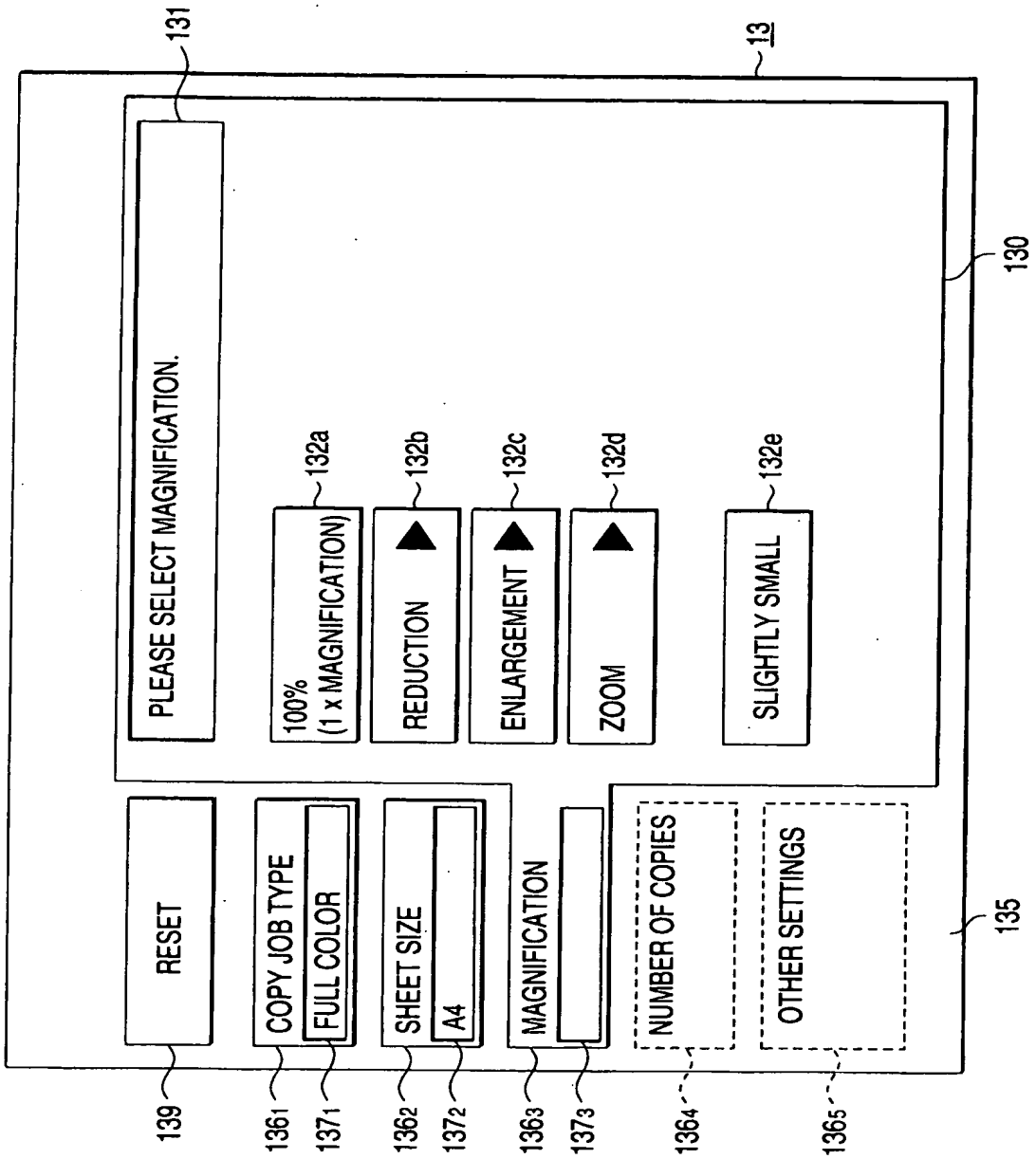

131
13
130
PLEASE SELECT MAGNIFICATION.
100%
(1 x MAGNIFICATION)
132a
REDUCTION
132b
ENLARGEMENT
132c
ZOOM
132d
SLIGHTLY SMALL
132e
RESET
COPY JOB TYPE
FULL COLOR
SHEET SIZE
A4
MAGNIFICATION
NUMBER OF COPIES
OTHER SETTINGS
135
139
1361
1371
1362
1372
1363
1373
1364
1365

FIG. 7

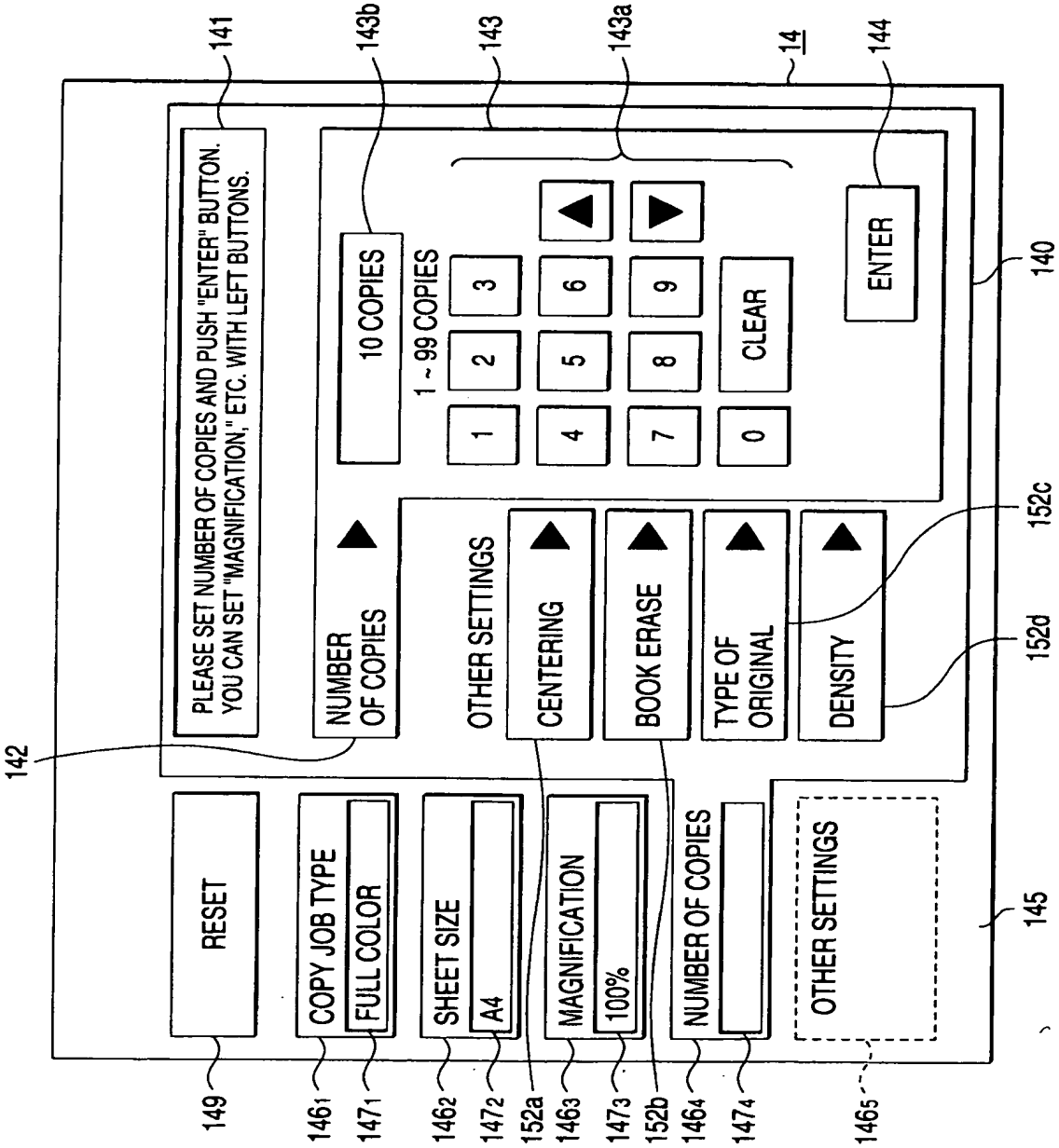

141
143b
143
143a
14
144
PLEASE SET NUMBER OF COPIES AND PUSH "ENTER" BUTTON.
YOU CAN SET "MAGNIFICATION," ETC. WITH LEFT BUTTONS.
10 COPIES
1 ~ 99 COPIES
1
2
3
4
5
6
7
8
9
0
CLEAR
ENTER
140
142
NUMBER OF COPIES
OTHER SETTINGS
CENTERING
BOOK ERASE
TYPE OF ORIGINAL
DENSITY
152c
152d
RESET
COPY JOB TYPE
FULL COLOR
SHEET SIZE
A4
MAGNIFICATION
100%
NUMBER OF COPIES
OTHER SETTINGS
145
149
146₁
147₁
146₂
147₂
152a
146₃
147₃
152b
146₄
147₄
146₅

FIG. 8

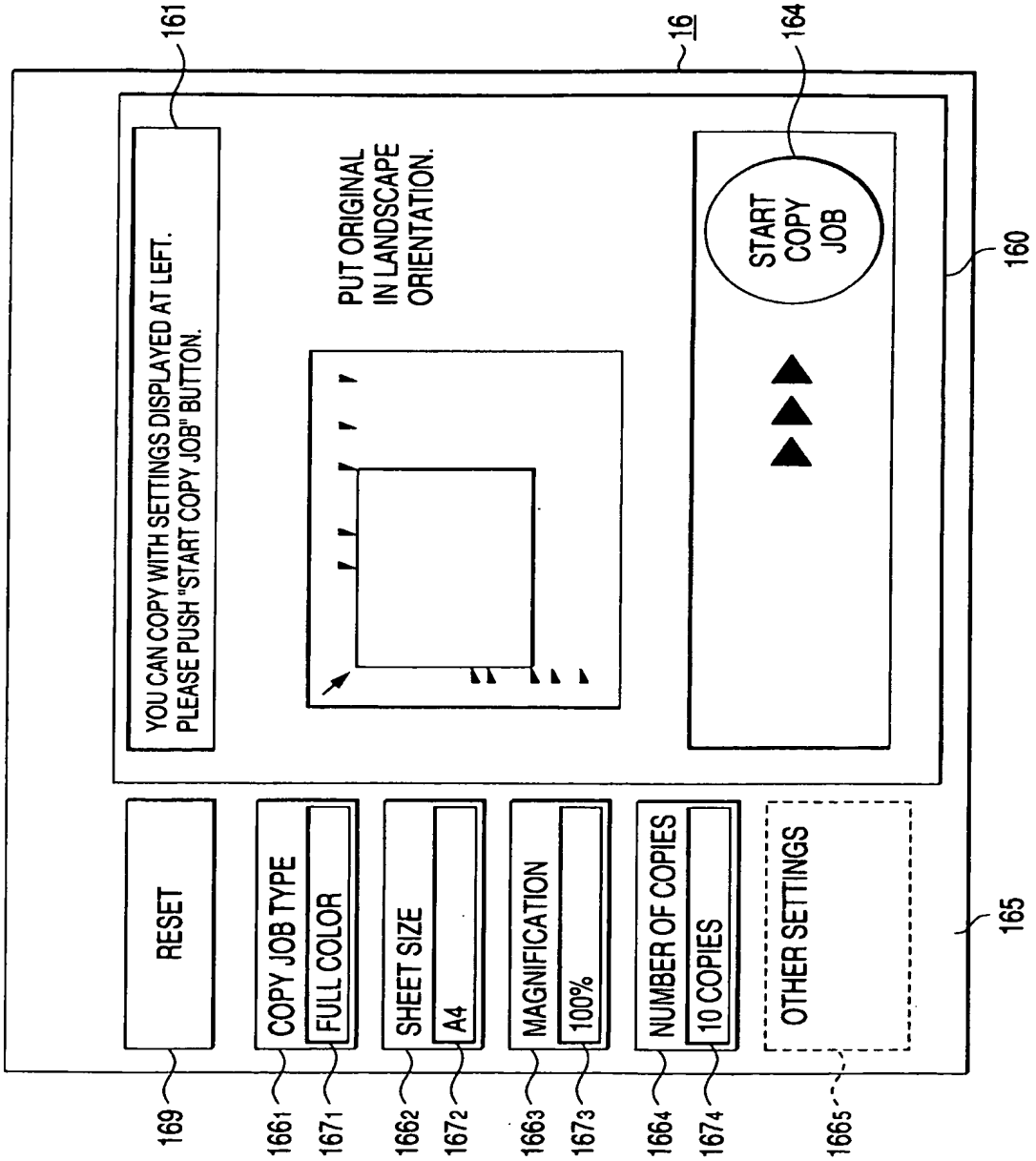

161
16
164
YOU CAN COPY WITH SETTINGS DISPLAYED AT LEFT.
PLEASE PUSH "START COPY JOB" BUTTON.
PUT ORIGINAL
IN LANDSCAPE
ORIENTATION.
START
COPY
JOB
160
RESET
COPY JOB TYPE
FULL COLOR
SHEET SIZE
A4
MAGNIFICATION
100%
NUMBER OF COPIES
10 COPIES
OTHER SETTINGS
165
169
166₁
167₁
166₂
167₂
166₃
167₃
166₄
167₄
166₅

FIG. 9

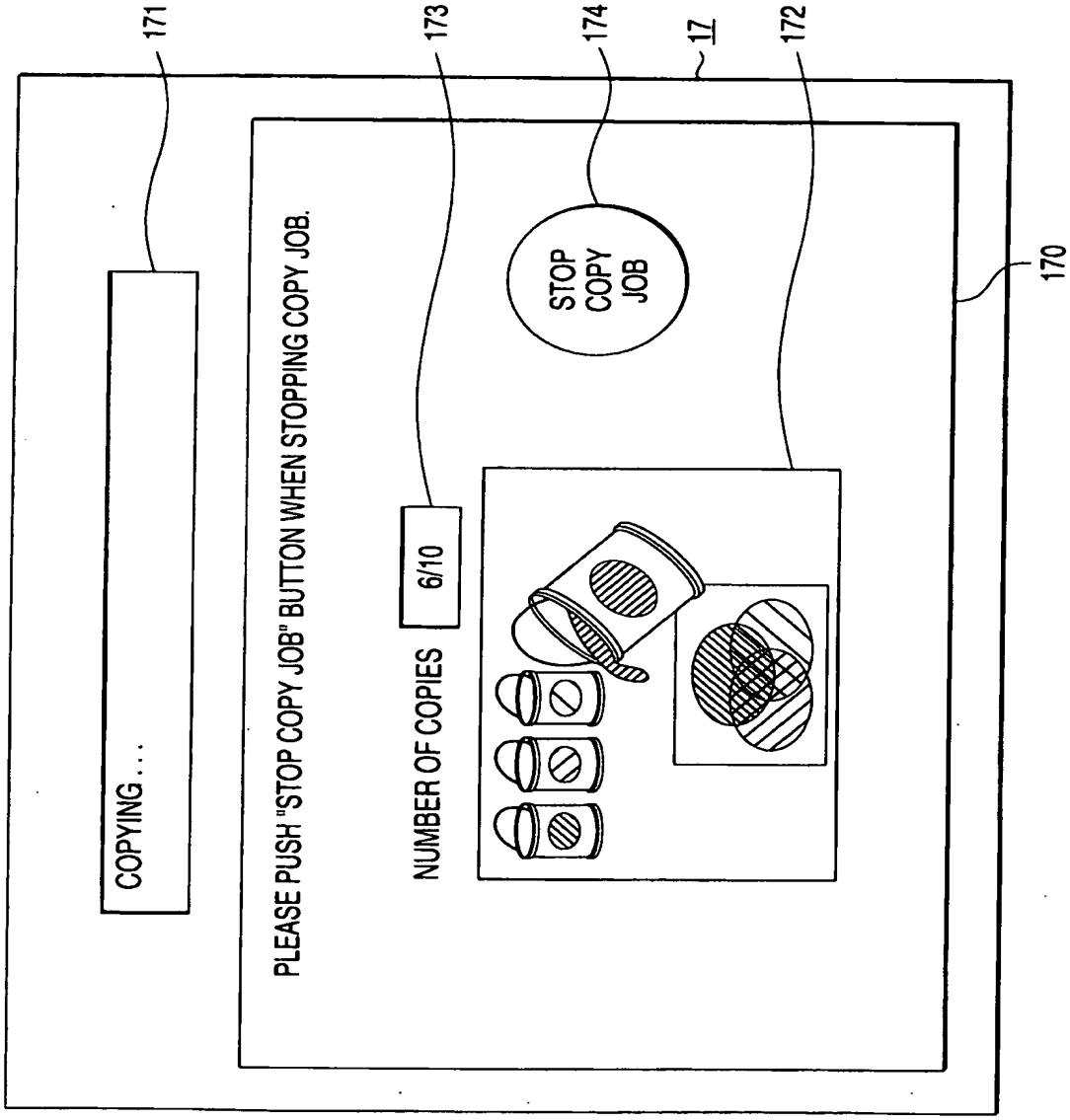

171
173
174
17
172
170
COPYING...
PLEASE PUSH "STOP COPY JOB" BUTTON WHEN STOPPING COPY JOB.
NUMBER OF COPIES
6/10
STOP COPY JOB

FIG. 10

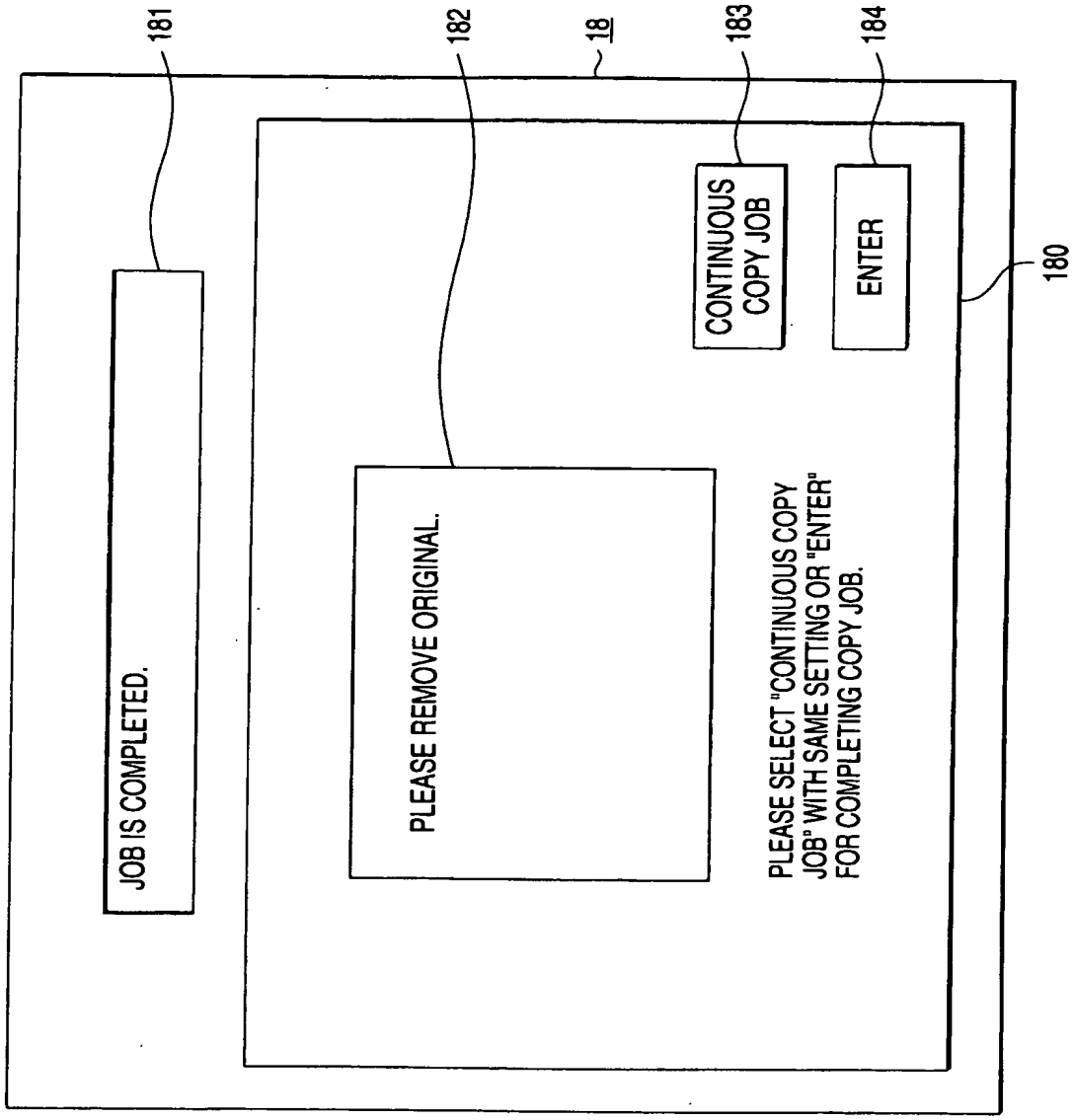

181
182
18
183
184
180
JOB IS COMPLETED.
PLEASE REMOVE ORIGINAL.
CONTINUOUS COPY JOB
ENTER
PLEASE SELECT "CONTINUOUS COPY JOB" WITH SAME SETTING OR "ENTER" FOR COMPLETING COPY JOB.

FIG. 11

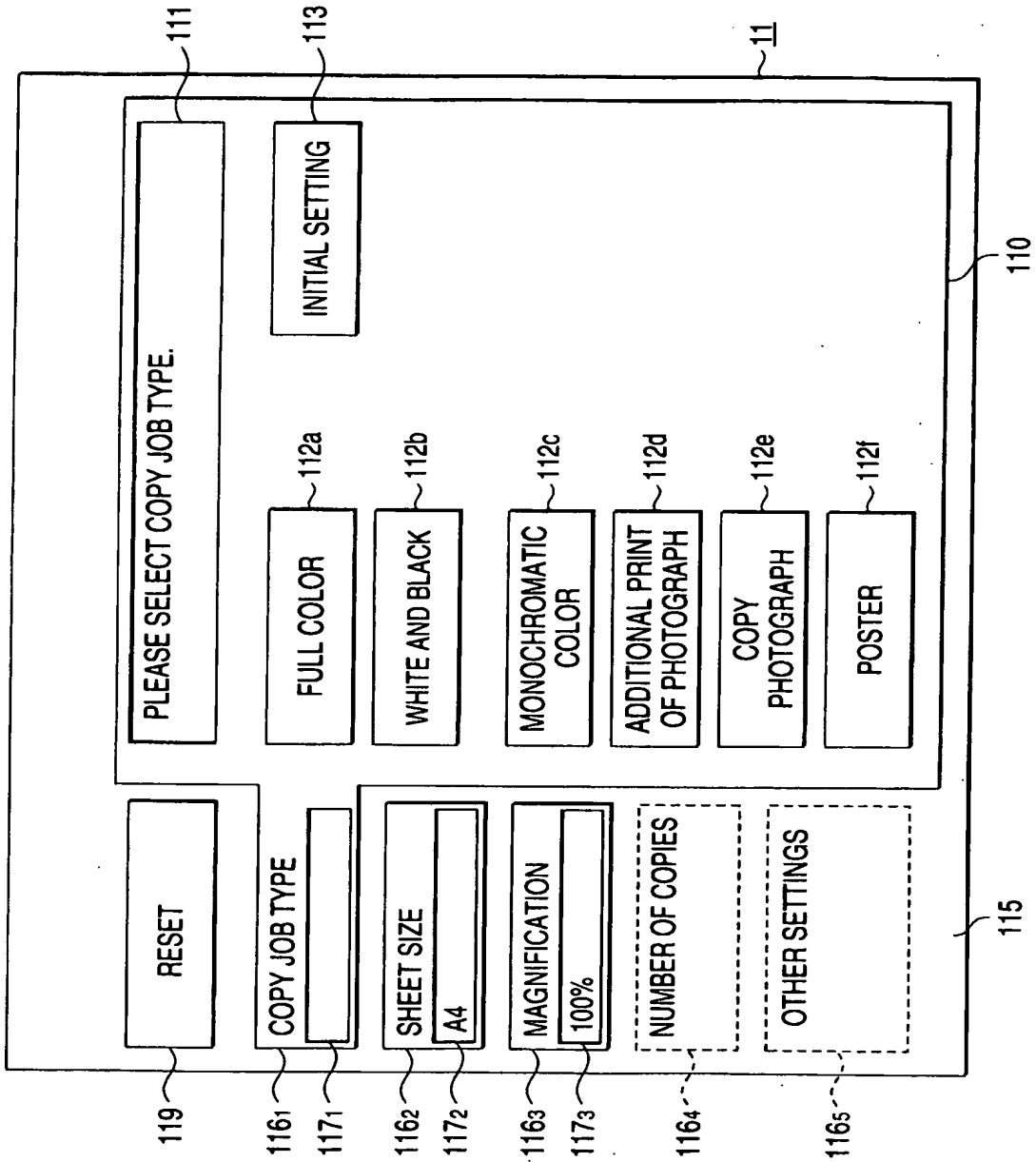

111
113
11
PLEASE SELECT COPY JOB TYPE.
INITIAL SETTING
110
112a
112b
112c
112d
112e
112f
FULL COLOR
WHITE AND BLACK
MONOCHROMATIC COLOR
ADDITIONAL PRINT OF PHOTOGRAPH
COPY PHOTOGRAPH
POSTER
RESET
COPY JOB TYPE
SHEET SIZE
A4
MAGNIFICATION
100%
NUMBER OF COPIES
OTHER SETTINGS
115
119
116₁
117₁
116₂
117₂
116₃
117₃
116₄
116₅

FIG. 12

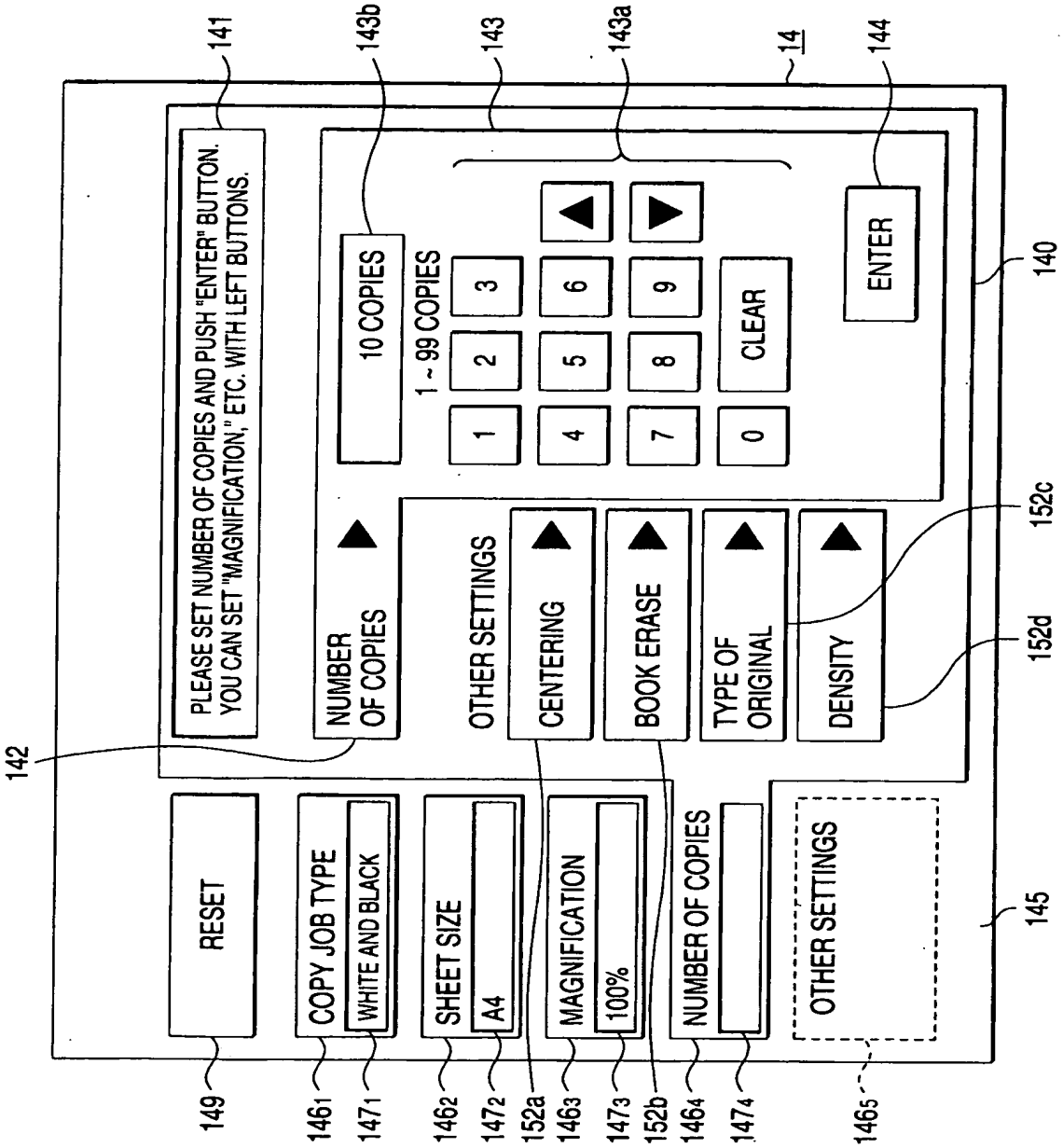

141
143b
143
143a
14
144
140
PLEASE SET NUMBER OF COPIES AND PUSH "ENTER" BUTTON.
YOU CAN SET "MAGNIFICATION," ETC. WITH LEFT BUTTONS.
10 COPIES
1 ~ 99 COPIES
1
2
3
4
5
6
7
8
9
0
CLEAR
ENTER
142
NUMBER OF COPIES
OTHER SETTINGS
CENTERING
BOOK ERASE
TYPE OF ORIGINAL
DENSITY
152c
152d
RESET
COPY JOB TYPE
WHITE AND BLACK
SHEET SIZE
A4
MAGNIFICATION
100%
NUMBER OF COPIES
OTHER SETTINGS
145
149
146₁
147₁
146₂
147₂
152a
146₃
147₃
152b
146₄
147₄
146₅

FIG. 13

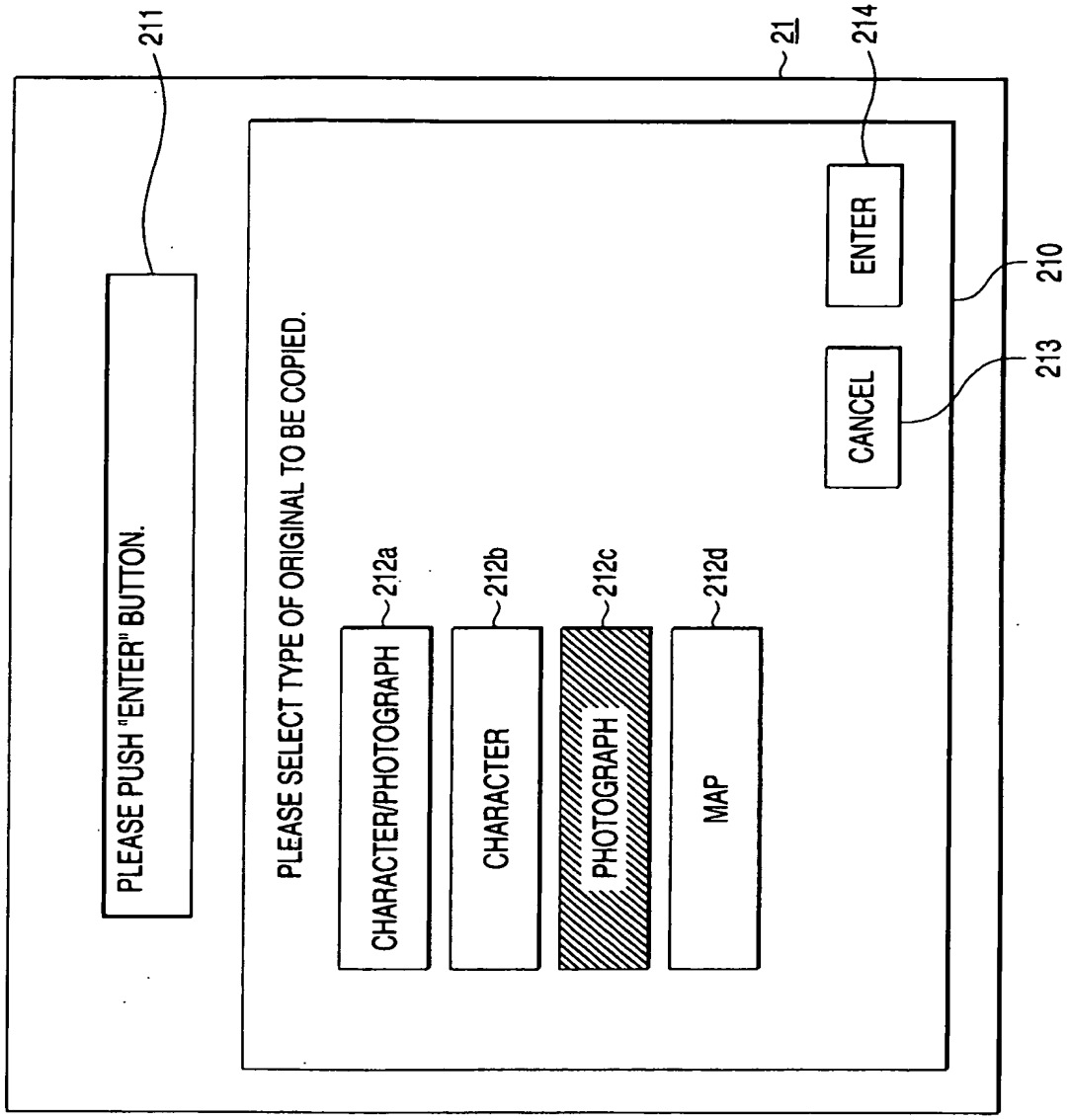

211
21
214
ENTER
210
213
CANCEL
PLEASE PUSH "ENTER" BUTTON.
PLEASE SELECT TYPE OF ORIGINAL TO BE COPIED.
212a
CHARACTER/PHOTOGRAPH
212b
CHARACTER
212c
PHOTOGRAPH
212d
MAP

FIG. 14

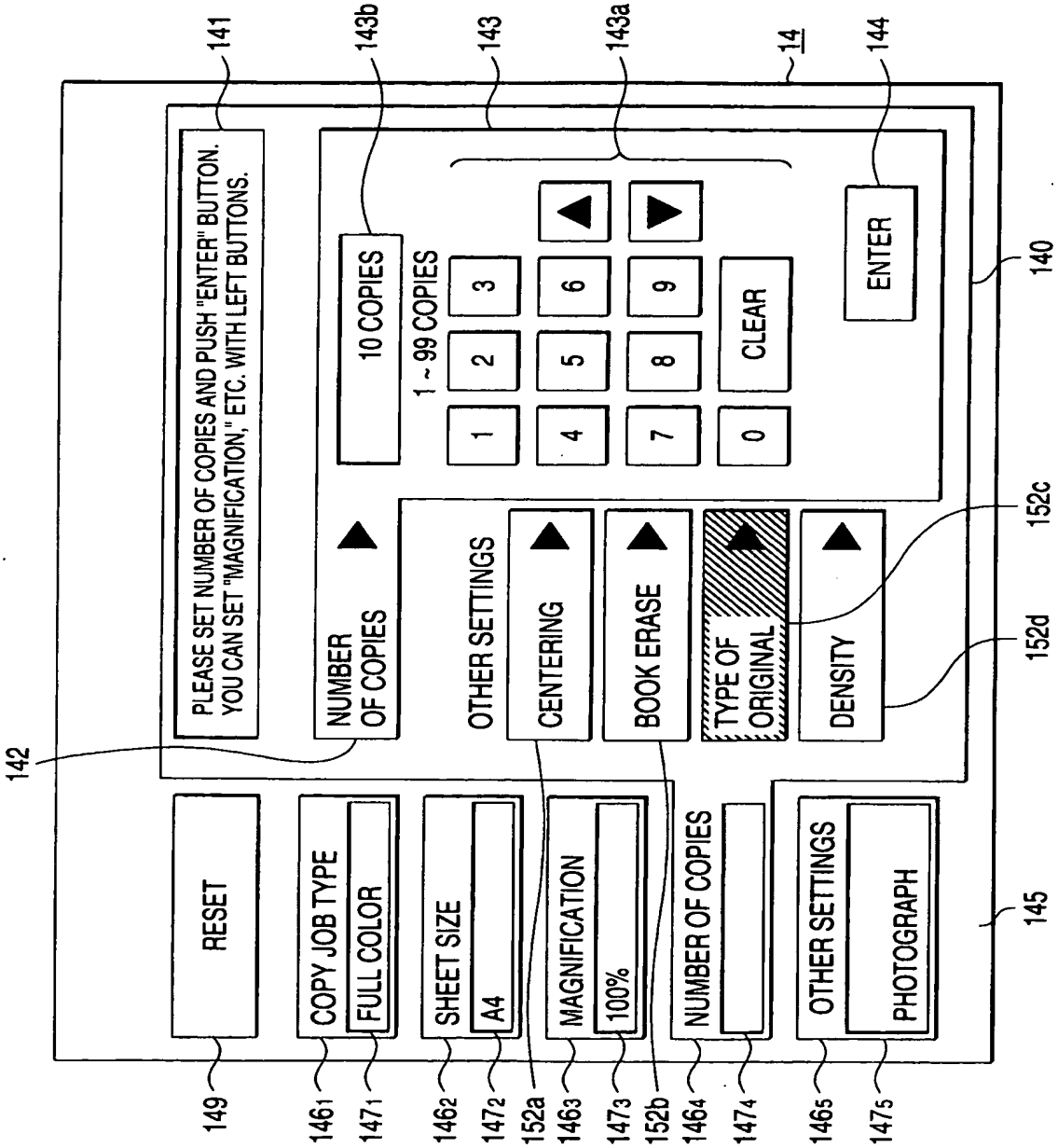

141
143b
143
143a
14
144
140
PLEASE SET NUMBER OF COPIES AND PUSH "ENTER" BUTTON.
YOU CAN SET "MAGNIFICATION," ETC. WITH LEFT BUTTONS.
NUMBER OF COPIES
10 COPIES
1 ~ 99 COPIES
1
2
3
4
5
6
7
8
9
0
CLEAR
ENTER
OTHER SETTINGS
CENTERING
BOOK ERASE
TYPE OF ORIGINAL
DENSITY
142
152c
152d
RESET
COPY JOB TYPE
FULL COLOR
SHEET SIZE
A4
MAGNIFICATION
100%
NUMBER OF COPIES
OTHER SETTINGS
PHOTOGRAPH
145
149
146₁
147₁
146₂
147₂
152a
146₃
147₃
152b
146₄
147₄
146₅
147₅

FIG. 15

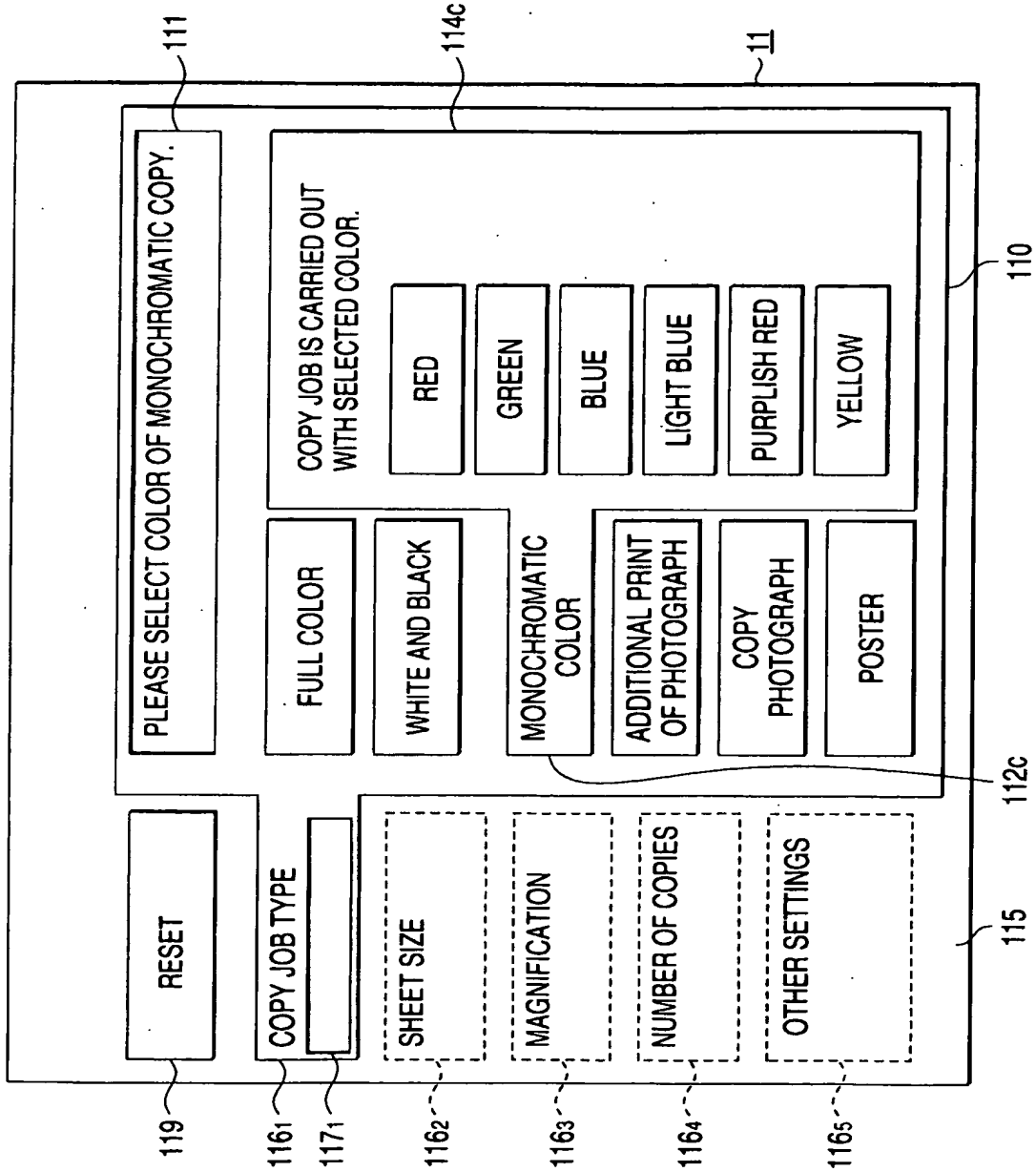

111
114c
11
110
PLEASE SELECT COLOR OF MONOCHROMATIC COPY.
COPY JOB IS CARRIED OUT WITH SELECTED COLOR.
RED
GREEN
BLUE
LIGHT BLUE
PURPLISH RED
YELLOW
FULL COLOR
WHITE AND BLACK
MONOCHROMATIC COLOR
ADDITIONAL PRINT OF PHOTOGRAPH
COPY PHOTOGRAPH
POSTER
112c
RESET
COPY JOB TYPE
SHEET SIZE
MAGNIFICATION
NUMBER OF COPIES
OTHER SETTINGS
115
119
116₁
117₁
116₂
116₃
116₄
116₅

FIG. 16

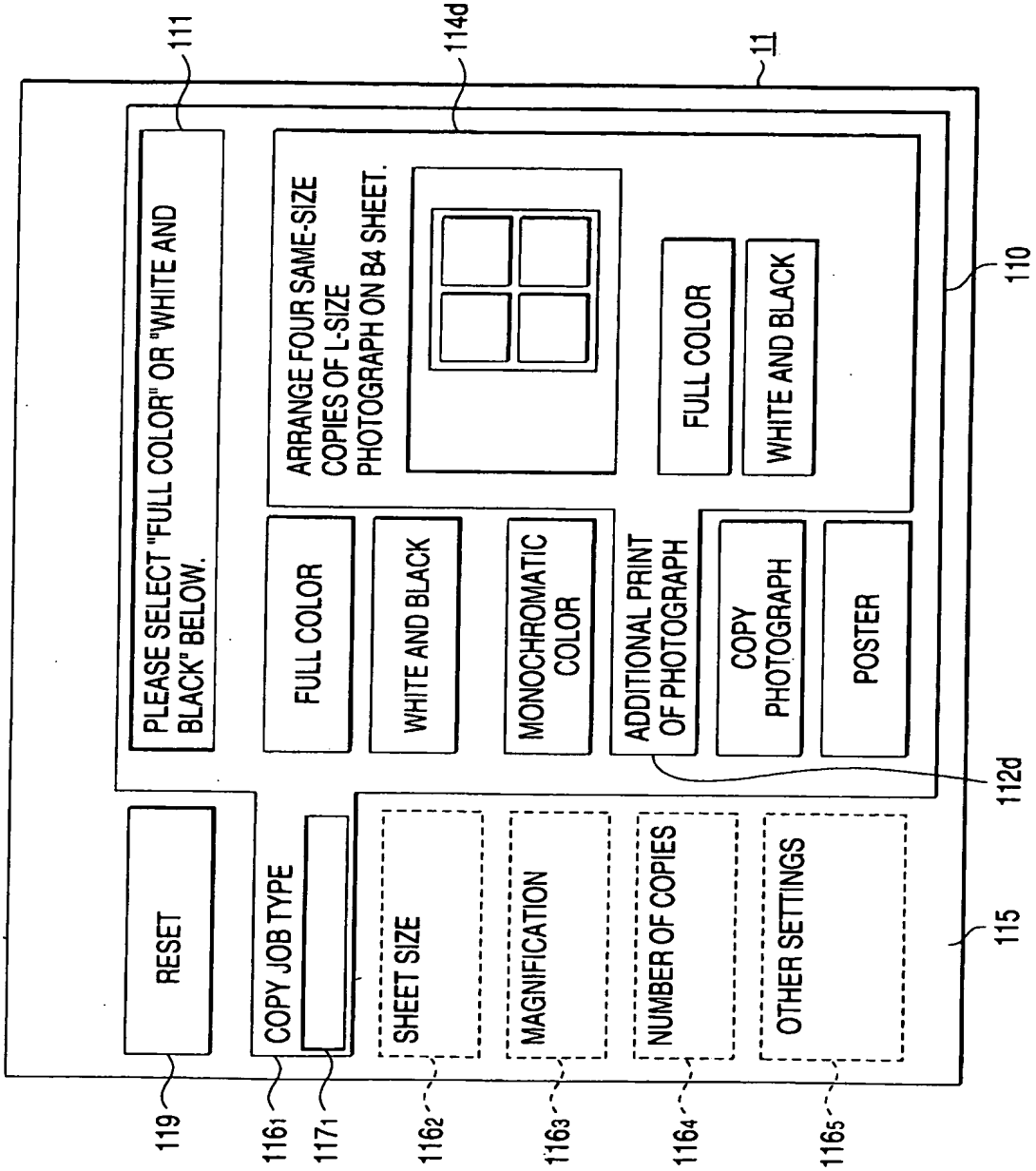

111
114d
11
110
PLEASE SELECT "FULL COLOR" OR "WHITE AND BLACK" BELOW.
ARRANGE FOUR SAME-SIZE COPIES OF L-SIZE PHOTOGRAPH ON B4 SHEET.
FULL COLOR
WHITE AND BLACK
FULL COLOR
WHITE AND BLACK
MONOCHROMATIC COLOR
ADDITIONAL PRINT OF PHOTOGRAPH
COPY PHOTOGRAPH
POSTER
112d
RESET
COPY JOB TYPE
SHEET SIZE
MAGNIFICATION
NUMBER OF COPIES
OTHER SETTINGS
115
119
116₁
117₁
116₂
116₃
116₄
116₅

FIG. 17

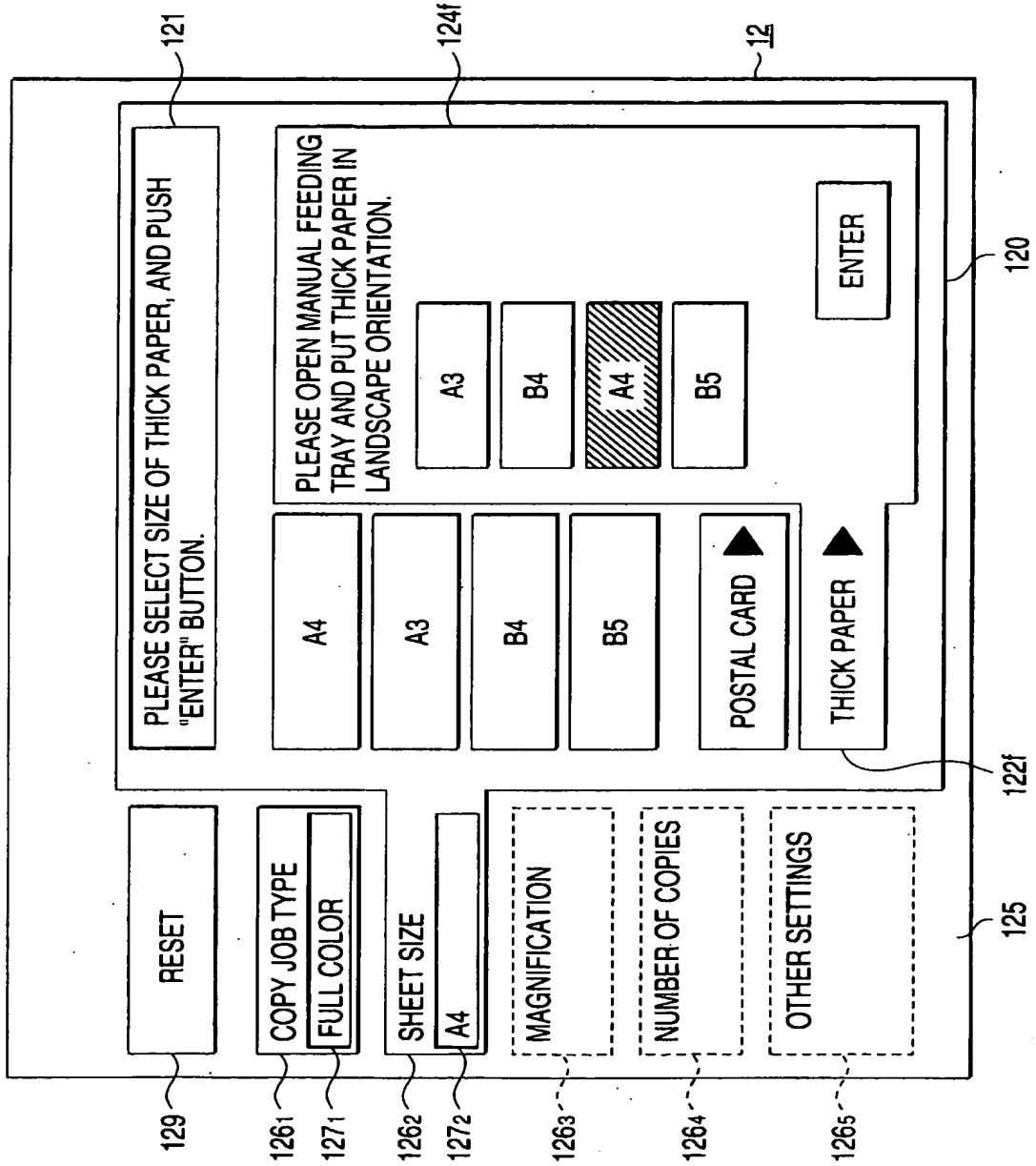

121
124f
12
120
122f
125
PLEASE SELECT SIZE OF THICK PAPER, AND PUSH "ENTER" BUTTON.
PLEASE OPEN MANUAL FEEDING TRAY AND PUT THICK PAPER IN LANDSCAPE ORIENTATION.
A3
B4
A4
B5
ENTER
A4
A3
B4
B5
POSTAL CARD
THICK PAPER
RESET
COPY JOB TYPE
FULL COLOR
SHEET SIZE
A4
MAGNIFICATION
NUMBER OF COPIES
OTHER SETTINGS
129
126₁
127₁
126₂
127₂
126₃
126₄
126₅

FIG. 18

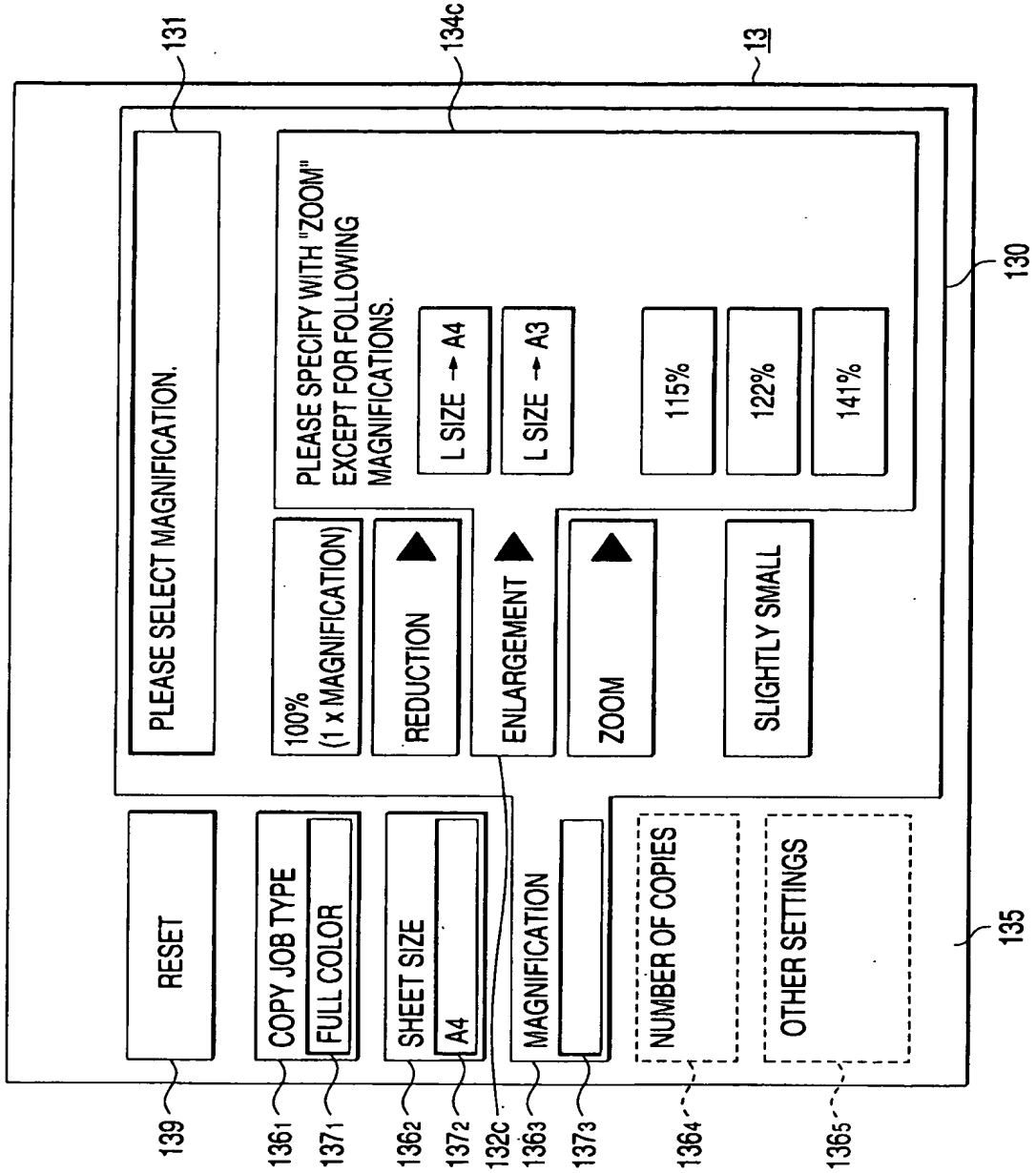

131
134c
13
130
135
PLEASE SELECT MAGNIFICATION.
PLEASE SPECIFY WITH "ZOOM" EXCEPT FOR FOLLOWING MAGNIFICATIONS.
L SIZE → A4
L SIZE → A3
115%
122%
141%
100% (1 x MAGNIFICATION)
REDUCTION
ENLARGEMENT
ZOOM
SLIGHTLY SMALL
RESET
COPY JOB TYPE
FULL COLOR
SHEET SIZE
A4
MAGNIFICATION
NUMBER OF COPIES
OTHER SETTINGS
139
136_1
137_1
136_2
137_2
132c
136_3
137_3
136_4
136_5

FIG. 19

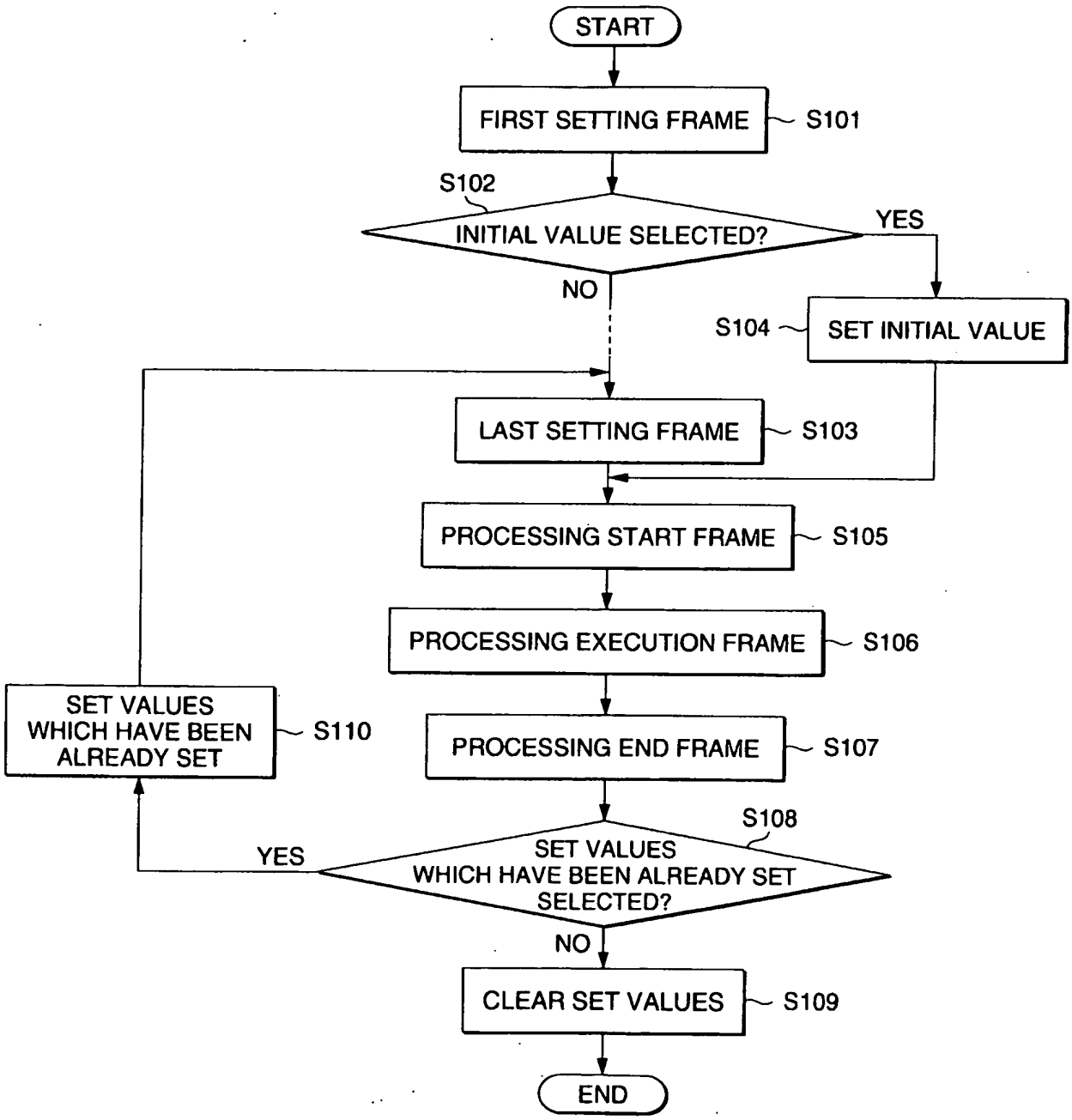
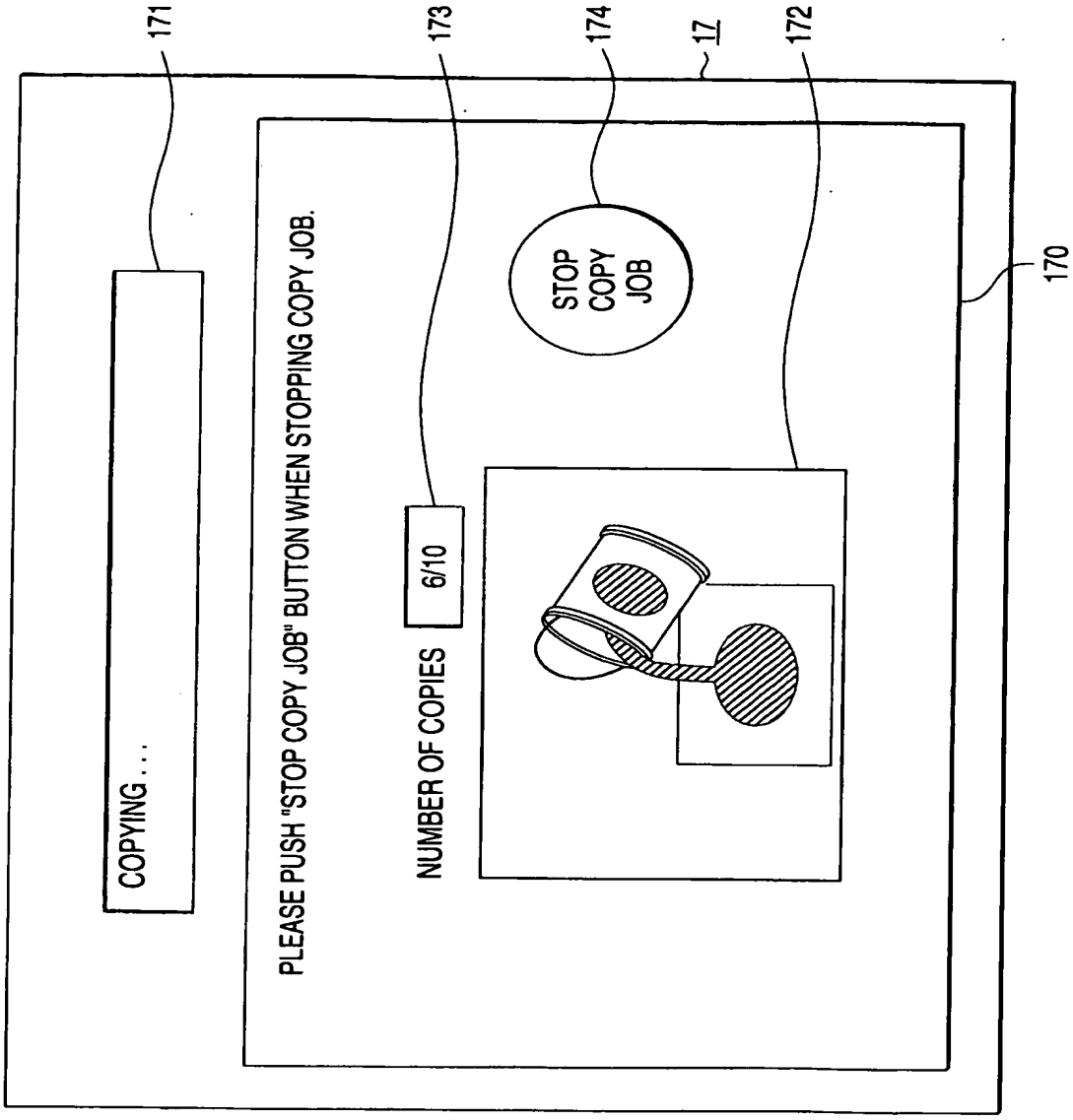

START
FIRST SETTING FRAME
S101
S102
INITIAL VALUE SELECTED?
YES
NO
S104
SET INITIAL VALUE
LAST SETTING FRAME
S103
PROCESSING START FRAME
S105
PROCESSING EXECUTION FRAME
S106
SET VALUES WHICH HAVE BEEN ALREADY SET
S110
PROCESSING END FRAME
S107
S108
YES
SET VALUES WHICH HAVE BEEN ALREADY SET SELECTED?
NO
CLEAR SET VALUES
S109
END

FIG. 20


171
173
174
17
172
170
COPYING . . .
PLEASE PUSH "STOP COPY JOB" BUTTON WHEN STOPPING COPY JOB.
NUMBER OF COPIES
6/10
STOP COPY JOB

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Masahiro MACHIDA et al. Group Art Unit: 2174

Application No.: 09/810,534 Examiner: P. KE

Filed: March 19, 2001 Docket No.: 108973

For: OPERATING METHOD AND DEVICE, AND IMAGE PROCESSING APPARATUS USING THE SAME

AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the July 25, 2007 Office Action and in consideration of the attached Request for Continued Examination, please consider the following:

Amendments to the Claims as reflected in the listing of claims; and

Remarks.

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An operating method for sequentially performing settings for plural items in a predetermined order, the method comprising:

storing plural setting ~~frames~~ menu display data provided to the respective plural items;

displaying, in a single frame of a display device, ~~one of~~ the stored plural setting ~~frames and all of the plural items;~~ menu display data of plural items to be set;

~~inputting~~ allowing an operator to input an instruction ~~from an operator;~~ to perform settings of the plural items through the display device; and

performing setting of the plural items in accordance with the inputted instruction; wherein

when setting of a first item which is being set is performed based on the inputted instruction, a setting ~~frame~~ menu display data of a second item that is next to the first item in the predetermined order is displayed, and the first item is ~~turned~~ displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another.

2. (Canceled)

3. (Currently Amended) The operating method as claimed in claim 1, wherein values which have been set are displayed for the item which has been already set.

4. (Original) The operating method as claimed in claim 1, wherein an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed.

5. (Original) The operating method as claimed in claim 4, wherein the setting frame for the item which has been already set is displayed, the setting for the item is carried out, and the setting frame being displayed is automatically restored to a previous setting frame which is displayed just before the setting frame for the item which has been already set is displayed.

6. (Original) The operating method as claimed in claim 5, wherein when the setting frame is restored to the previous setting frame, a state which has been just previously set is maintained.

7. (Currently Amended) An operating device for sequentially performing settings for plural items in a predetermined order, comprising:

a storage unit that stores plural setting ~~frames~~ menu display data provided to the respective plural items;

a display unit that displays, in a single frame, ~~one of~~ the stored plural setting ~~frames and all of the plural items;~~ menu display data of plural items to be set;

an input unit that inputs an instruction from an ~~operator;~~ operator to perform settings of the plural items through the display device; and

a control unit that that performs setting of the plural items in accordance with the inputted instruction, wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting ~~frame~~ menu display data of a second item that is next to the first item in the predetermined order, and the first item is ~~turned~~ displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display so as to be distinguishable from one another.

8. (Canceled)

9. (Previously Presented) The operating device as claimed in claim 7, wherein values which have been already set are displayed for the item which has been already set.

10. (Original) The operating device as claimed in claim 7, wherein an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed.

11. (Original) The operating device as claimed in claim 7, wherein a setting frame for an item which has been already set is displayed, the setting for the item is carried out, and the setting frame being displayed is automatically restored to a previous setting frame which is displayed just before the setting frame for the item which has been already set is displayed.

12. (Previously Presented) The operating method as claimed in claim 11, wherein when the setting frame is restored to the previous setting frame, a state which has been just previously set is maintained.

13. (Currently Amended) An image processing apparatus having an operating device for sequentially performing settings for plural items in a predetermined order, the image processing apparatus comprising:

a storage unit that stores plural setting ~~frames~~ menu display data provided to the respective plural items; and

a display unit that displays, in a single frame, ~~one of~~ the stored plural setting ~~frames and all of the plural items;~~ menu display data of plural items to be set;

an input unit that inputs an instruction from an ~~operator;~~ operator to perform settings of the plural items through the display device; and

a control unit that performs setting of the plural items in accordance with the inputted instruction, wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting ~~frame~~ menu display data of a second item that is next to the first item in the predetermined order, and the first item is turned an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display so as to be distinguishable from one another.

14. (Currently Amended) An operating method for sequentially performing settings for plural items in a predetermined order to perform settings for a processor, the method comprising:

displaying, in a single frame of a display device, all of the plural items and one of plural setting ~~frames provided to the plural items;~~menu display data of plural items to be set;

inputting an instruction from an ~~operator;~~operator to perform settings of the plural items through the display device;

setting the plural items in accordance with the inputted instruction;

carrying out a processing operation of the processor on the basis of contents set for the plural items; and

maintaining the contents set for the plural items; wherein

when setting of a first item which is being set is performed based on the inputted instruction, the display unit displays a setting ~~frame~~ menu display data of a second item that is next to the first item in the predetermined order, and the first item is ~~turned~~ displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another.

15. (Original) The operating method as claimed in claim 14, wherein after the processing operation of the processor is executed, an instruction can be provided as to whether the contents set for the plural items are maintained or the contents set are cleared.

16. (Currently Amended) An operating method for sequentially performing settings for plural items in a predetermined order to perform the setting for a processor, the method comprising:

enabling provision of instruction by a user for all the settings for the plural items to be initial settings;

setting the plural items in accordance with the provided instruction; and

displaying, in a single frame of a display device, all of the plural items and one of plural setting frames provided to the plural items, wherein

when setting of a first item which is being set is performed based on the inputted instructions, the display unit displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is ~~turned~~ displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another.

17. (Original) The operating method as claimed in claim 16, wherein the instruction is provided on an initial frame.

18. (Currently Amended) An operating device for sequentially performing settings for plural items in a predetermined order to perform settings for a processor, the device comprising:

a holding unit that holds contents set for the plural items after the processing operation of the processor is carried out on the basis of the contents set for the plural items; and

a single frame of a display displaying all of the plural items and one of plural setting frames provided to the plural items, wherein

when setting of a first item which is being set is performed, a setting frame of a second item that is next to the first item in the predetermined order is displayed, and the first item is ~~turned~~ displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another.

19. (Original) The operating device as claimed in claim 18, further comprising:

an instructing unit that makes an instruction as to whether the contents set for the plural items are maintained or the contents set are cleared after the processing operation of the processor is executed.

20. (Currently Amended) An operating device for sequentially performing settings for plural items in a predetermined order to perform settings for a processor, the device comprising:

an instructing unit that instructs all the settings for the plural items to be initial settings based on a user command; and

a single frame of a display displaying all of the plural items and one of plural setting frames provided to the plural items, wherein

when setting of a first item which is being set is performed based on the user command, the single frame of the display displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is ~~turned~~ displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another.

21. (Original) The operating device as claimed in claim 20, wherein the instructing unit is displayed on an initial frame.

22. (Currently Amended) An image processing apparatus having an operating device for sequentially performing settings for plural items in a predetermined order to perform the setting for a processor, the image processing apparatus comprising:

a holding unit that holds contents set for the plural items after the processing operation of the image processing apparatus is executed on the basis of the contents set for the plural items; and

a single frame of a display that displays all the plural items and one of plural setting frames provided to the plural items, wherein

when setting of a first item which is being set is performed based on the user command, the single frame of the display displays a setting frame of a second item that is next to the first item in the predetermined order, and the first item is ~~turned~~ displayed as an item which has been already set, and

an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so as to be distinguishable from one another.

REMARKS

Claims 1, 3-7 and 9-22 are pending in this application. By this Amendment, claims 1, 7, 13, 14, 16, 18, 20 and 22 are amended. No new matter is added by these amendments. Reconsideration of the application based on the above amendments and the following remarks is respectfully requested.

The Office Action objects to claims 1, 7, 13, 14, 16, 18, 20 and 22 for informalities. The claims have been amended to obviate the objection. Applicants respectfully request reconsideration and withdrawal of the objection to the claims.

The Office Action rejects claims 1, 4-7, 10-12, 13, 14, 16-18 and 20-22 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,181,893 to Collard et al. (hereinafter "Collard") in view of U.S. Patent No. 6,115,720 to Bleizeffer et al. (hereinafter "Bleizeffer"); and rejects claims 3 and 9 under 35 U.S.C. §103(a) as being unpatentable over Collard in view of Bleizeffer and further in view of U.S. Patent No. 5,543,857 to Wehmeyer. Applicants respectfully traverse these rejections.

The Office Action asserts that Collard in view of Bleizeffer teaches all the features recited in independent claims. However, the applied references do not teach or suggest a method for sequentially performing settings for plural items in a predetermined order including at least "when setting of a first item which is being set is performed based on the inputted instruction, a setting menu display data of a second item that is next to the first item in the predetermined order is displayed, and the first item is displayed as an item which has been already set," as recited in claim 1.

Collard, in col. 7, lines 20-50 and Fig. 4, teaches the layout of the display screen 60 after the function of the apparatus has been chosen. Additionally, Collard teaches once a function, for example, printer has been selected, displaying the features associated with the printing function in a different frame than the selected feature printer. However, Collard does not teach

or suggest displaying the features associated with the copier function, which is next to the printer function, in the predetermined order of Collard. Therefore, Collard does not teach or suggest "when setting of a first item which is being set is performed based on the inputted instruction, a setting menu display data of a second item that is next to the first item in the predetermined order is displayed, and the first item is displayed as an item which has been already set," as recited in claim 1.

The device claims, apparatus claims, method claims of claims 7, 13, 14, 16, 18, 20 and 22 are similarly rejected and therefore allowable based on the above rationale.

Bleizeffer and Wehmeyer fail to teach or suggest the above features, and therefore, fail to make up for the deficiency of Collard.

For at least the above reasons, the combination of Collard, Bleizeffer and Wehmeyer cannot reasonably be considered to teach, or to have suggested, the combination of all the features recited in at least independent claims 1, 7, 13, 14, 16, 18, 20 and 22. Further, claims 3-6, 9-12, 15, 17, 19 and 21 would also not have been suggested by the applied references for at least the respective dependency of these claims on allowable independent claims, as well as for the separately patentable subject matter that each of these claims recites.

Accordingly, reconsideration and withdrawal of the subject matter of claims 1-22 under 35 U.S.C. §103(a) is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-22 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Tiffany J. Brooks
Registration No. 57,912

JAO:TJB/jth

Attachment:
Request for Continued Examination

Date: October 25, 2007

OLIFF & BERRIDGE, PLC
P.O. Box 320850
Alexandria, Virginia 22320-4850
Telephone: (703) 836-6400

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,534	03/19/2001	Masahiro Machida	108973	6709

25944 7590 06/25/2008

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P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER	
KE, PENG	

ART UNIT	PAPER NUMBER
2174	

MAIL DATE	DELIVERY MODE
06/25/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/810,534	MACHIDA ET AL.	
	Examiner	Art Unit	
	SIMON KE	2174	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/25/07*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7 and 9-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7 and 9-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/25/07 has been entered.

Claims 1, 3-7, and 9-22 are pending in this application. Claims 1, 7, 13, 14, 16, 18, 20, and 22 are independent claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4-7, 10-12, 13, 14, 16-18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collard US Patent 6,181,893 in view of Bleizeffer US Patent 6,115,720.

As per claim 1, Collard teaches an operating method for sequentially performing setting for plural items in a predetermined order, the method comprising:

Storing plural setting frames provided to the respective plural items; (see Collard; figure 4, column 7, lines 20-50)

Displaying, in a single frame of a display device, one of the stored plural setting meanu display data of plural items to be set; (see Collard; figure 4, column 7, lines 20-50)

Allowing an operator to input an instruction from to perform setting of the plural item through the display device; (see Collard, column 7, lines 10-20) and

Performing setting of the plural items in accordance with the inputted instruction; (see Collard, column 9, lines 25-40) wherein

When setting of a first item which is being set is performed based on the inputted instruction, (see Collard; column 6, lines 45-65) setting menu display data of a second item that is next to the first item in the predetermined order is displayed, and the first item displays the selected item. (see Collard; column 6, lines 35-46)

Collard further teaches an item which is being an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so that the item that is being set is distinguishable from item which has been already set and item which has not yet been set. (see column 7, lines 25-45; figure 4, "Basic Settings" is displayed differently from the rest of the items.)

However, Collard fails to teach an item which has been already set is distinguishable from another an item which has not yet been set.

Bleizeffer teaches an item which has been already set is distinguishable from another an item which has not yet been set. (see Bleizeffer, column2, lines 44-61; figure 18, column 13, lines 15-55)

It would have been obvious to an artisan at the time of the invention to include Bleizeffer's teaching with method of Collard in order to allow users to distinguish what is done and what is not.

As per claim 4, Collard and Bleizeffer teach the operating method as claimed in claim 1. Collard further teaches wherein an operation of displaying a setting frame for an item which has been already set is allowed to be carried out when one of the plural setting frames is displayed. (see Collard; figure 4, column 7, lines 20-50)

As per claim 5, Collard and Bleizeffer teach the operating method as claimed in claim 4. Bleizeffer further teaches wherein the setting frame for the item which has been already set is displayed, the setting for the item is carried out, and the setting frame being displayed is automatically restored to a previous setting frame which is displayed just before the setting frame for the item which has been already set is displayed. (see Bleizeffer; column 11, lines 31-column 12, line 10)

As per claim 6, Collard and Bleizeffer teach the operating method as claimed in claim 5. Bleizeffer further teaches wherein when the setting frame is restored to the previous setting frame, a state which has been just previously set is maintained. (see Bleizeffer, column 11, lines 31-column12, lines 10)

As per claims 7 and 10-12, they are of similar scope to claims 1 and 4-6 respectively, and are rejected under the same rationale.

As per claim 13, it is rejected with the same rationale as claim 1. Supra.

As per claim 14, Collard teaches an operating method for sequentially performing settings for plural items in a predetermined order to perform settings for a processor, the method of: comprising:

displaying, in a single frame of a display device, all of the plural items and one of plural setting menu display data of plural items to be set; (see Collard; figure 4, column 7, lines 20-50)

inputting an instruction from an operator to perform setting of the plural items through the display device; (see Collard, column 7, lines 10-20)

setting the plural items in accordance with the inputted instruction; (see Collard; column 6, lines 45-65)

carrying out a processing operation of the processor on the basis of contents set for the plural items; (see Collard, column 9, lines 25-40) and

maintaining the contents set for the plural items;

wherein when setting of a first item which is being set is performed based on the inputted instruction, (see Collard; column 6, lines 45-65) the display unit displays a setting menu display data of a second item that is next to the first item in the predetermined order, and the first item

displays the selected item. (see Collard; column 6, lines 35-46) and

Collard further teaches an item which is being an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so that the item that is being set is distinguishable from item which has been already set and item which has not yet been set. (see column 7, lines 25-45; figure 4, "Basic Settings" is displayed differently from the rest of the items.)

However, Collard fails to teach an item which has been already set is distinguishable from one another an item which has not yet been set.

Bleizeffer teaches an item which has been already set is distinguishable from one another an item which has not yet been set. (see Bleizeffer, column2, lines 44-61; figure 18, column 13, lines 15-55)

It would have been obvious to an artisan at the time of the invention to include Bleizeffer's teaching with method of Collard in order allow users to distinguish what is done and what is not.

As per claim 16, it is rejected with the same rationale as claim 14. Supra.

As per claim 17, Collard and Bleizeffer teach operating method as claimed in claim 16. Bleizeffer further teaches wherein the instruction is provided on an initial frame. (see Bleizeffer; figure, the instruction on the right side of the frame is the initial instruction)

As per claim 18, it is rejected with the same rationale as claim 14. Supra.

As per claim 20, it is rejected with the same rationale as claim 14. Supra.

As per claim 21, it is of the same scope as claim 17. Supra.

AS per claim 22, it is rejected with the same rationale as claim 14. Supra.

Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over anticipated Collard US Patent 6,181,893 in view of Bleizeffer US Patent 6,115,720 further in view of Wehmeyer US Patent 5,543,857.

As per claim 3, Collard and Bleizeffer teach the method of claim 1. They fail to teach wherein values which have been set are displayed for the items-item which have-has been already set.

Wehmeyer teaches values which have been set are displayed for the items-item which have-has been already set. (see Wehmeyer, figure 4, items, "mute", "TV only", and "Stereo")

It would have been obvious to an artisan at the time of the invention to include Wehmeyer's teaching method of Bleizeffer in order to provide user with an intuitive object oriented guide which naturally, and in a non-confusing fashion, lead the viewer to the correct control for accomplishing his task.

As per claim 9, it is rejected under the same scope as claim 9. Supra.

Claims 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over anticipated Collard US Patent 6,181,893 in view of Bleizeffer US Patent 6,115,720 further in view of Shiels, U.S. Patent 5,751,953.

As per claim 15, Collard and Bleizeffer teaches the operating method as claimed in claim 14. They fail to teach wherein after the processing operation of the processor is executed, an

instruction can be provided as to whether the contents set for the plural items are maintained or the contents set are cleared.

Shiels teaches wherein after a processing operation of the processor is executed, an instruction can be provided as to whether the contents set for the plural items are maintained or the contents set are cleared (se Shiels, column 7, lines 32-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Shiels with the method of Bleizeffer and Wehmeyer in order to allow a user to save or discard settings set for a particular process.

As per claim 19, it is of similar scope to claim 15 and it rejected under the same rationale as claim 15. Supra.

Response to Argument

Applicant's arguments filed 10/25/07 have been fully considered but they are not persuasive.

Applicant's argument focused on the following:

A) Whether Collard teaches a setting menu display data of a second item that is next the first item in the predetermined order is displayed?

A) Collard teaches this limitation because it displays multiple setting menu for different items simultaneously in a predetermined order. (see Collard, figure 4, col. 7, lines 30-70)

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peng Ke whose telephone number is (571) 272-4062. The examiner can normally be reached on M-Th and Alternate Fridays 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kristine L. Kincaid can be reached on (571) 272-4063. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Peng Ke
/Peng Ke/
Primary Examiner, Art Unit 2174

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Masahiro MACHIDA et al.

Application No.: 09/810,534

Filed: March 19, 2001

Group Art Unit: 2174

Examiner: P. KE

Docket No.: 108973

For: OPERATING METHOD AND DEVICE, AND IMAGE PROCESSING APPARATUS USING THE SAME

NOTICE OF APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES AND PETITION FOR EXTENSION OF TIME

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby appeal to the Board of Patent Appeals and Interferences from the Decision of the Primary Examiner dated June 25, 2008.

The $540.00 Appeal Fee ($270.00 Small Entity) is:

☒ Enclosed (Check No. 211428)

☐ Not required (fee paid in prior appeal in this application with no Board Decision on the merits).

The shortened statutory period having expired September 27, 2008, an extension of one month is hereby requested. Included in the attached check is $130 in payment of the fee for a one month extension of time for filing this Notice of Appeal.

In the event of any underpayment or overpayment, please debit or credit Deposit Account No. 15-0461 as needed in order to effect proper filing of this Notice of Appeal.

Respectfully submitted,

10/28/2008 JADD01 00000037 09810534
01 FC:1401 540.00 OP
02 FC:1251 130.00 OP

James A. Oliff
Registration No. 27,075

Stephen P. Catlin
Registration No. 36,101

JAO:KXH/hms

Date: October 27, 2008

OLIFF & BERRIDGE, PLC
P.O. Box 320850
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DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Masahiro MACHIDA et al.

Group Art Unit: 2174

Application No.: 09/810,534

Examiner: P. KE

Filed: March 19, 2001

Docket No.: 108973

For: OPERATING METHOD AND DEVICE, AND IMAGE PROCESSING APPARATUS USING THE SAME

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This request is being filed with a Notice of Appeal and Petition for Extension of Time. Review of the June 25, 2008 Office Action is requested for the reasons set forth in the attached five or fewer sheets.

Should any questions arise regarding this submission, or the Review Panel believes that anything further would be desirable in order to place this application in even better condition for allowance, the Review Panel is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Stephen P. Catlin
Registration No. 36,101

JAO:KXH/hms

Date: October 27, 2008

OLIFF & BERRIDGE, PLC
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DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
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REMARKS

Claims 1, 3-7 and 9-22 are pending.

I. Rejection of Claims 1, 4-7, 10-4, 16-18 and 20-22

The Office Action rejects claims 1, 4-7, 10-4, 16-18 and 20-22 under 35 U.S.C. §103(a) over U.S. Patent No. 6,181,893 to Collard et al. (hereinafter "Collard") in view of U.S. Patent No. 6,115,720 to Bleizeffer (hereinafter "Bleizeffer"). Appellants respectfully disagree and assert that a *prima facie* case of obviousness has not been established.

Independent claims 1, 7, 13, 14, 16, 18, 20 and 22 each recite, *inter alia*, that (1) an item which has been already set, (2) an item which is being set along with parameters to choose from, and (3) an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another.

As shown in Appellants' Fig. 5, for example, the menu item button 126_1 displays a parameter display window 127_1 indicating a parameter that has already been set. The menu item button 126_2 displays a blank parameter display window 127_2 because the parameters for the button 126_2 is being set by the user. The menu item buttons 126_3-126_5 are indicated with dotted lines without any parameter display windows because the parameters have not yet been set by the user. Therefore, the user can easily recognize which item has been set, which item is being set, and which item has not yet been set by the user.

The Office Action alleges that Collard discloses an item which has been already set, an item which is being set along with parameters to choose from, and an item which has not yet been set are displayed in the single frame so that the item that is being set is distinguishable from the item which has been already set and the item which has not yet been set. The Office Action asserts that the "Basic Settings" shown in Fig. 4 of Collard are displayed differently from the rest of the items and correspond to the claimed feature.

The Office Action then concedes that Collard fails to teach that the item which has been already set is distinguishable from the item which has not yet been set, and asserts that Bleizeffer allegedly discloses this feature. Appellants respectfully disagree with these assertions.

a) **Bleizeffer Not Analogous to Collard**

Collard is directed to a digital image reproduction apparatus that has a display as shown in Fig. 4 for setting parameters. In particular, Collard discloses in Fig. 4 a menu screen in which the user sets parameters for reproducing digital images. Collard merely discloses an item that is being set is displayed differently. Collard does not teach that (1) an item already set, (2) an item being set, and (3) an item not yet set are displayed in a single frame and distinguishable from one anther. In fact, the Office Action acknowledges this and relies on Bleizeffer for deficiencies.

Bleizeffer, on the other hand, is directed to a method and apparatus for compensating for deficiencies existing in programs to assist a user through installing a program. See Abstract of Bleizeffer. Bleizeffer provides a solution to a problem in installing a complex program on mainframe computers where only little information is given as to the interrelationship between series of tasks to accomplish, the status of various subtasks which comprises the overall tasks, or the overall relationship of the various subtasks to each other and the task as a whole. See col. 1, lines 52-63 of Bleizeffer. Bleizeffer is not related to setting of item parameters or display thereof and is instead only concerned with displaying status information. Bleizeffer provides the solution by providing an indication to a user of a workstation as steps of a task have been completed. See col. 2, lines 47-61 of Bleizeffer.

Bleizeffer does not recognize a problem in, or provide a solution to the problem in, a menu screen of a digital image reproduction apparatus as taught by Collard during the item setting. Therefore, Bleizeffer and Collard are not in the same field of endeavor as they do not

involve the same problems. As such, Bliezeffer is non-analogous to Collard. Thus, those skilled in the art in the field of a menu screen of a digital image reproduction apparatus or item setting would not have looked to or considered the teaching of Bleizeffer as a solution to the problem in the menu screen. The Office Action fails to provide a reasonable rationale that would have led one of ordinary skill in the art to the non-analogous teachings of Bleizeffer. Accordingly, those skilled in the art would not have been motivated to combine Collard and Bleizeffer as alleged.

b) **Combination Based on Impermissible Hindsight Knowledge**

Bleizeffer only displays the completed tasks with text field and the incomplete tasks without the text field. Bleizeffer does not teach or suggest distinguishably displaying items being set along with parameters to choose from. Therefore, neither Collard nor Bleizeffer reasonably teach or suggest display of 1) an item which has been already set, 2) an item which is being set along with parameters to choose from, and 3) an item which has not yet been set are displayed in the single frame of the display device so as to be distinguishable from one another, as recited in independent claims 1, 7, 13, 14, 16, 18, 20 and 22.

Therefore, about a sufficient rationale from the teachings themselves, the combination of Collard and Bleizeffer can only be a product based on impermissible hindsight knowledge gained from Appellants' disclosure. This is improper. Moreover, even if combined, the combination fails to teach each and every claimed feature and the Office Action has failed to explain a rationale for the further modification or combination to resolve such deficiencies.

At least for these reasons, Appellants respectfully submit that claims 1, 7, 13, 14, 16, 18, 20 and 22 are patentable over Collard and Bleizeffer.

Dependent claims 4-6, 10-12, 17,18 and 21 are allowable at least for their dependence on the allowable claims, as well as for the additional features they recite. Thus, withdrawal of the rejection is respectfully requested.

II. Rejections of claims 3, 9, 15 and 19

The Office Action rejects claims 3 and 9 under 35 U.S.C. §103(a) over Collard in view of Bleizeffer and further in view of U.S. Patent No. 5,543,857 to Wehmeyer; and rejects claims 15 and 19 under 35 U.S.C. §103(a) over Collard in view of Bleizeffer and further in view of U.S. Patent No. 5,751,953 to Shiels. These rejections are respectfully traversed.

Neither Wehmeyer nor Shiels overcome the deficiencies of Collard and Bleizeffer with respect to claims 1, 7, 14 and 18. Therefore, claims 3, 9, 15 and 19 are allowable at least for their dependence to claims 1, 7, 14 and 18, respectively, as well as for the additional features they recite. Withdrawal of the rejection is respectfully requested.

III. Conclusion

In view of the foregoing, Appellants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1, 3-7 and 9-22 are earnestly solicited.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,534	03/19/2001	Masahiro Machida	108973	6709

25944 7590 11/26/2008

OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER	
KE, PENG	

ART UNIT	PAPER NUMBER
2174	

MAIL DATE	DELIVERY MODE
11/26/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of Panel Decision from Pre-Appeal Brief Review	Application/Control No.	Applicant(s)/Patent under Reexamination
	09/810,534	MACHIDA ET AL.
	SIMON KE	Art Unit: 2174

This is in response to the Pre-Appeal Brief Request for Review filed 27 October 2008.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☒ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☒ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: *1,3-7,9-22*.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☐ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

(1) *SIMON KE*.

(2) *MUJTABA K. CHAUDRY*.

(3) */Stephen Hong/SPE 2174*.

(4)_____.

/Stephen S. Hong/
Supervisory Patent Examiner, Art Unit 2178

US006181893B1

(12) **United States Patent**
Collard et al.

(10) **Patent No.: US 6,181,893 B1**
(45) **Date of Patent: Jan. 30, 2001**

(54) **DIGITAL COPYING APPARATUS WITH A PERSONAL DATA STORAGE SYSTEM**

(75) Inventors: **René F. A. Collard**, Gennep; **Peter J. H. M. Teeuwen**, Maasbree; **Monica M. W. M. Roosen**, Venlo; **Robertus C. W. T. M. van den Tillaart**, Gemert, all of (NL)

(73) Assignee: **Oce-Technologies B.V.**, Ma Venlo (NL)

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

(21) Appl. No.: **09/272,556**

(22) Filed: **Mar. 19, 1999**

(30) **Foreign Application Priority Data**

Mar. 19, 1998 (NL) 1008642

(51) **Int. Cl.**[7] **G03G 15/00**; G06K 15/02; G06K 15/14

(52) **U.S. Cl.** **399/80**; 399/81

(58) **Field of Search** 399/80, 8, 81, 399/411

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,068,888 11/1991 Scherk et al. .

FOREIGN PATENT DOCUMENTS

0689157A2 12/1994 (EP) .

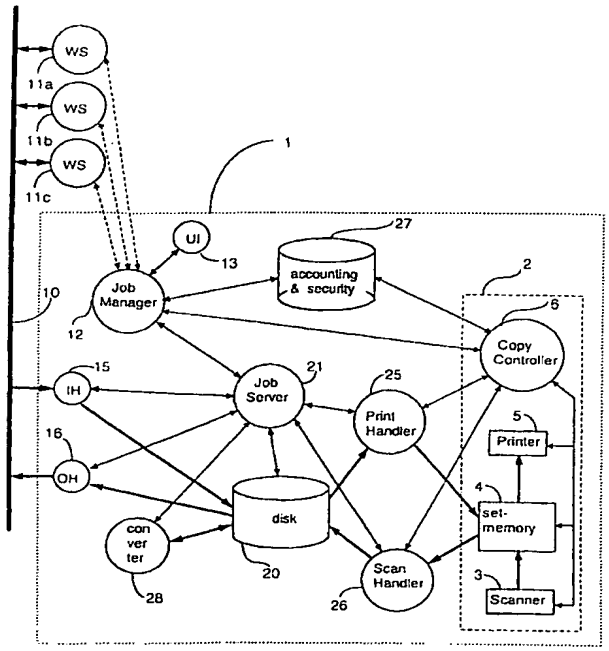
0756414A2 1/1997 (EP) .

Primary Examiner—Richard Moses

(57) **ABSTRACT**

A digital image reproduction apparatus including a scanner unit, a printer unit, a memory, an operator control unit integrated in the apparatus and provided with an input device and a display for the user to give operator control commands to the apparatus, a network connection unit for coupling to a network for the purpose of communication with a digital external environment including at least a number of workstations of users, a management unit connected to the scanner unit, printer unit, memory and network connection unit, and, via the network connection unit, to the workstations, which management unit maintains logic storage spaces in the memory, each allocated to a specific user. The management unit, when receiving from a said user's workstation a digital data file for printing, stores the file in the logic storage space of the relevant user and passes it for printing to the printer unit only on a command from the operator control unit, which command identifies the relevant file, and also, on receipt from the operator control unit of an order for scanning, such job being provided with a user identification, stores the data generated by the scanner unit in the logic storage space of the relevant user and passes it to a workstation of the relevant user only on a command from the latter workstation, which command identifies the relevant file. Other files, such as sets of adjustment parameters for printing or scanning processes, can also be stored in the logic storage spaces.

20 Claims, 15 Drawing Sheets



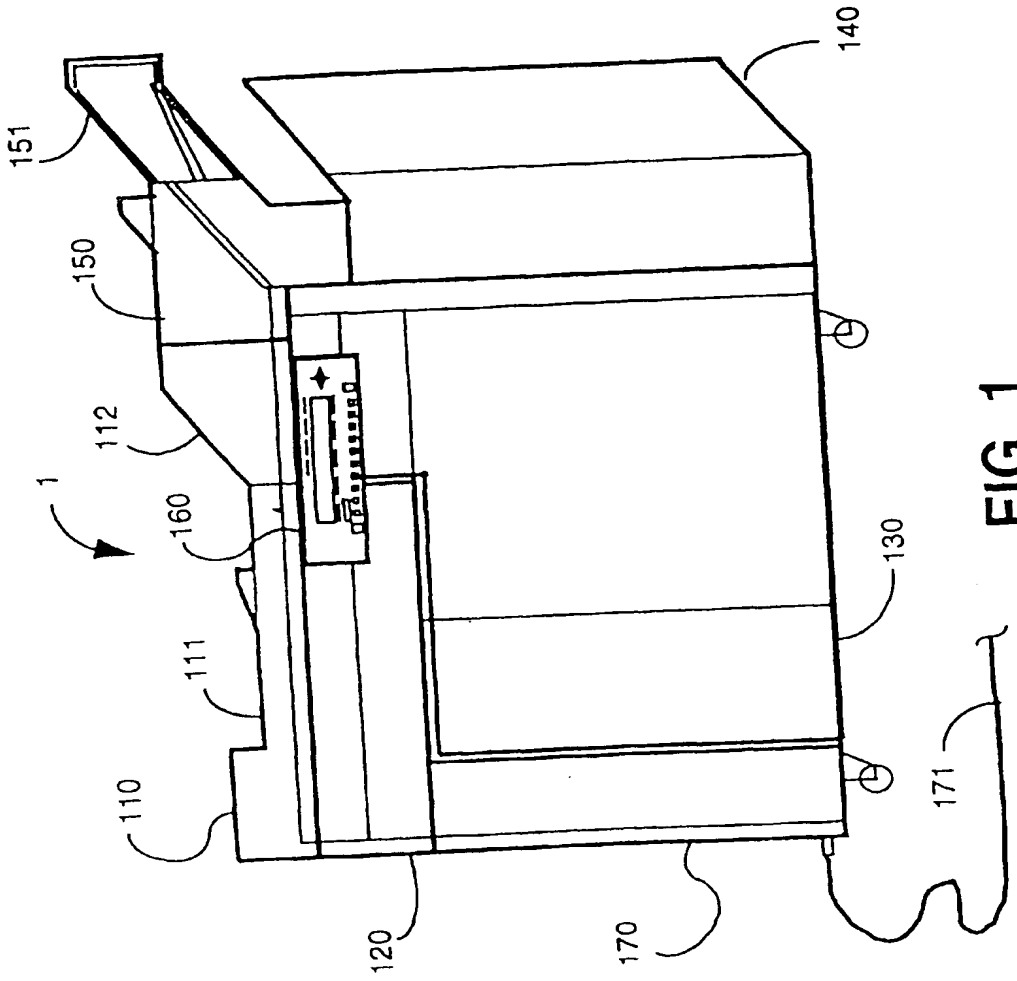


FIG. 1

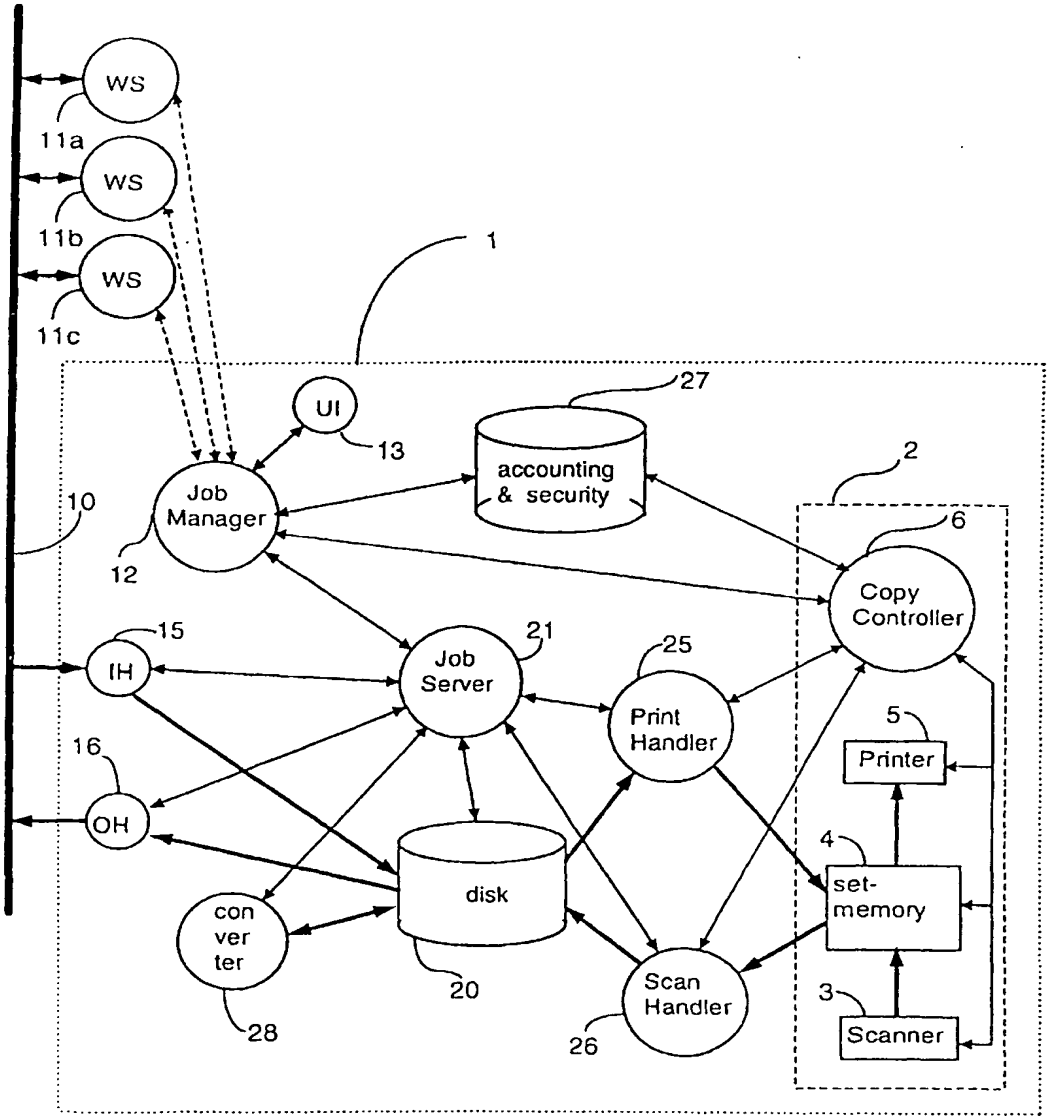

WS
11a
WS
11b
WS
11c
1
UI
13
27
accounting & security
2
10
Job Manager
12
6
Copy Controller
15
IH
21
Job Server
25
Print Handler
5
Printer
16
OH
4
set-memory
disk
con ver ter
20
28
Scan Handler
26
3
Scanner

FIG. 2

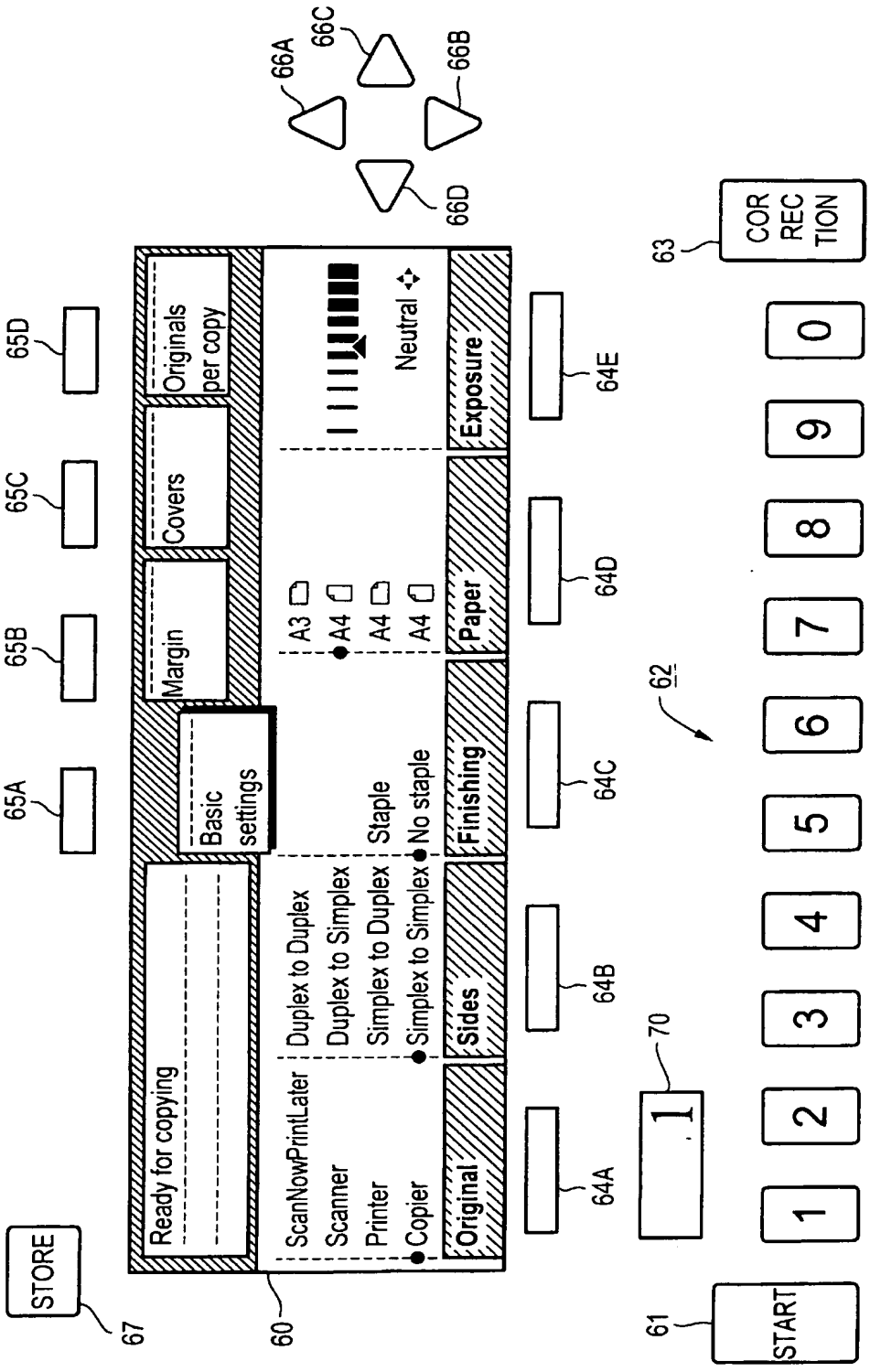
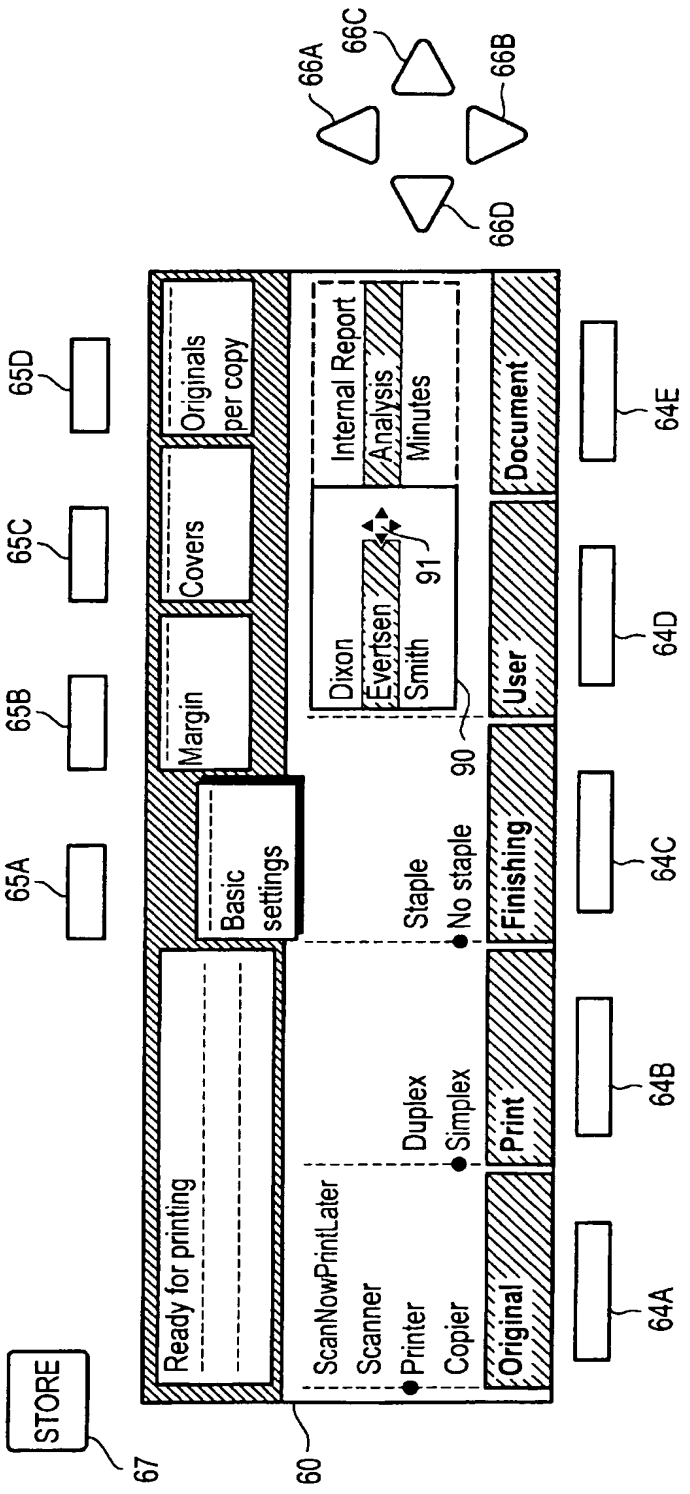

66A
66C
66B
66D
65D
65C
65B
65A
Originals per copy
Covers
Margin
Basic settings
Ready for copying
ScanNowPrintLater
Scanner
Printer
Copier
Original
Duplex to Duplex
Duplex to Simplex
Simplex to Duplex
Simplex to Simplex
Sides
Staple
No staple
Finishing
A3
A4
A4
A4
Paper
Neutral
Exposure
64A
64B
64C
64D
64E
STORE
67
60
62
63
COR REC TION
1
2
3
4
5
6
7
8
9
0
70
61
START

FIG. 3


66A
66C
66B
66D
65D
65C
65B
65A
Originals per copy
Covers
Margin
Basic settings
Internal Report
Analysis
Minutes
Dixon
Evertsen
Smith
91
90
Staple
No staple
Duplex
Simplex
ScanNowPrintLater
Scanner
Printer
Copier
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STORE
67
60
Document
User
Finishing
Print
Original
64E
64D
64C
64B
64A

FIG. 4

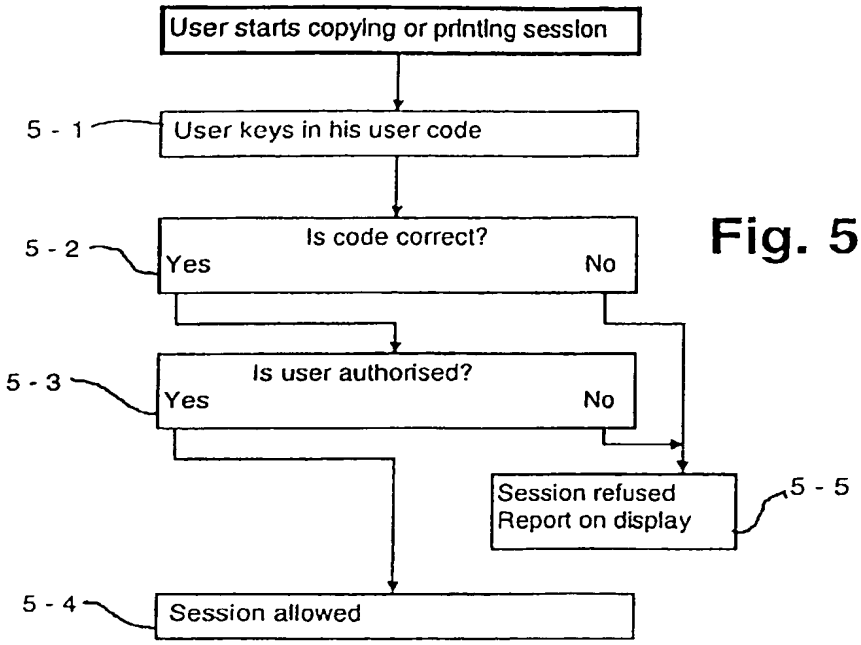

User starts copying or printing session
5 - 1
User keys in his user code
5 - 2
Is code correct?
Yes
No
5 - 3
Is user authorised?
Yes
No
Session refused
Report on display
5 - 5
5 - 4
Session allowed

Fig. 5A

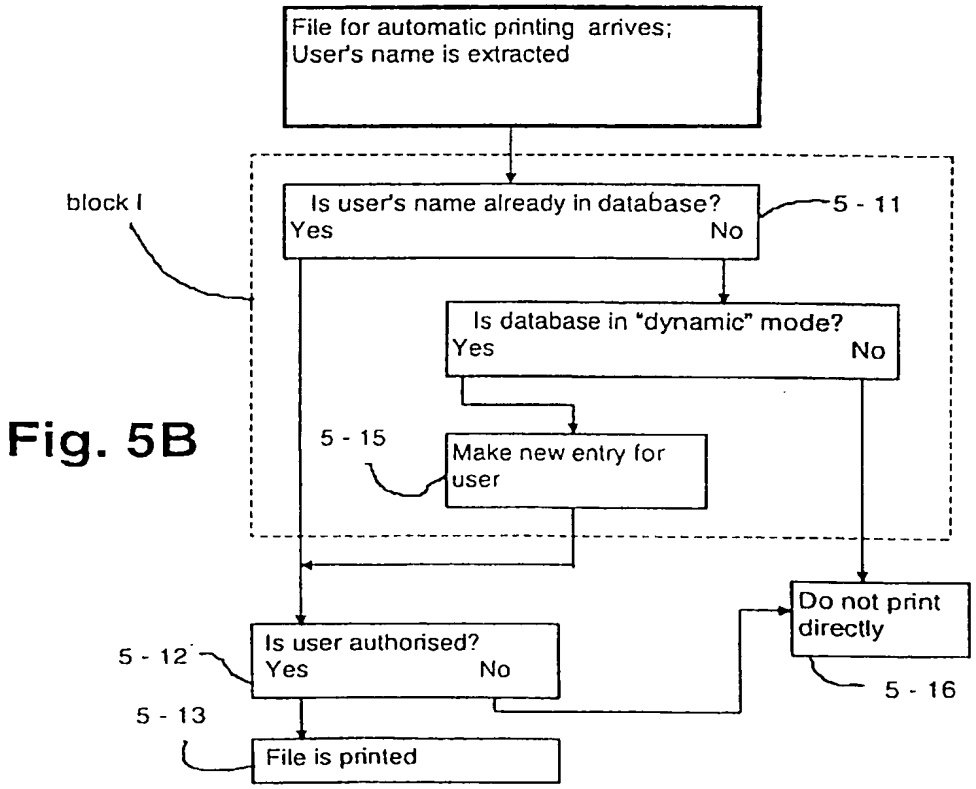

File for automatic printing arrives;
User's name is extracted
block I
Is user's name already in database?
Yes
No
5 - 11
Is database in "dynamic" mode?
Yes
No
5 - 15
Make new entry for user
Do not print directly
5 - 16
5 - 12
Is user authorised?
Yes
No
5 - 13
File is printed

Fig. 5B

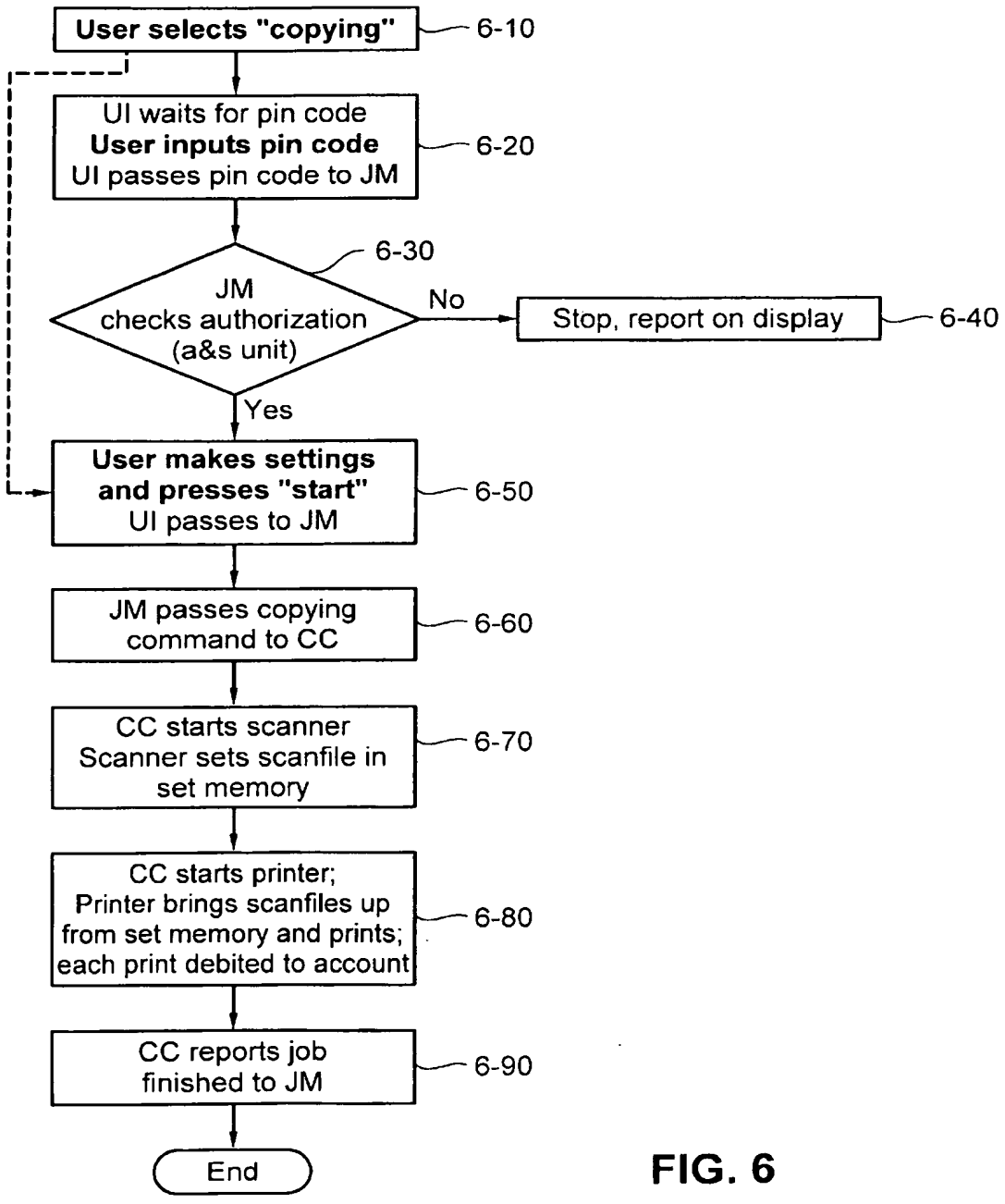

User selects "copying"
6-10
UI waits for pin code
User inputs pin code
UI passes pin code to JM
6-20
6-30
JM
checks authorization
(a&s unit)
No
Stop, report on display
6-40
Yes
User makes settings
and presses "start"
UI passes to JM
6-50
JM passes copying
command to CC
6-60
CC starts scanner
Scanner sets scanfile in
set memory
6-70
CC starts printer;
Printer brings scanfiles up
from set memory and prints;
each print debited to account
6-80
CC reports job
finished to JM
6-90
End

FIG. 6

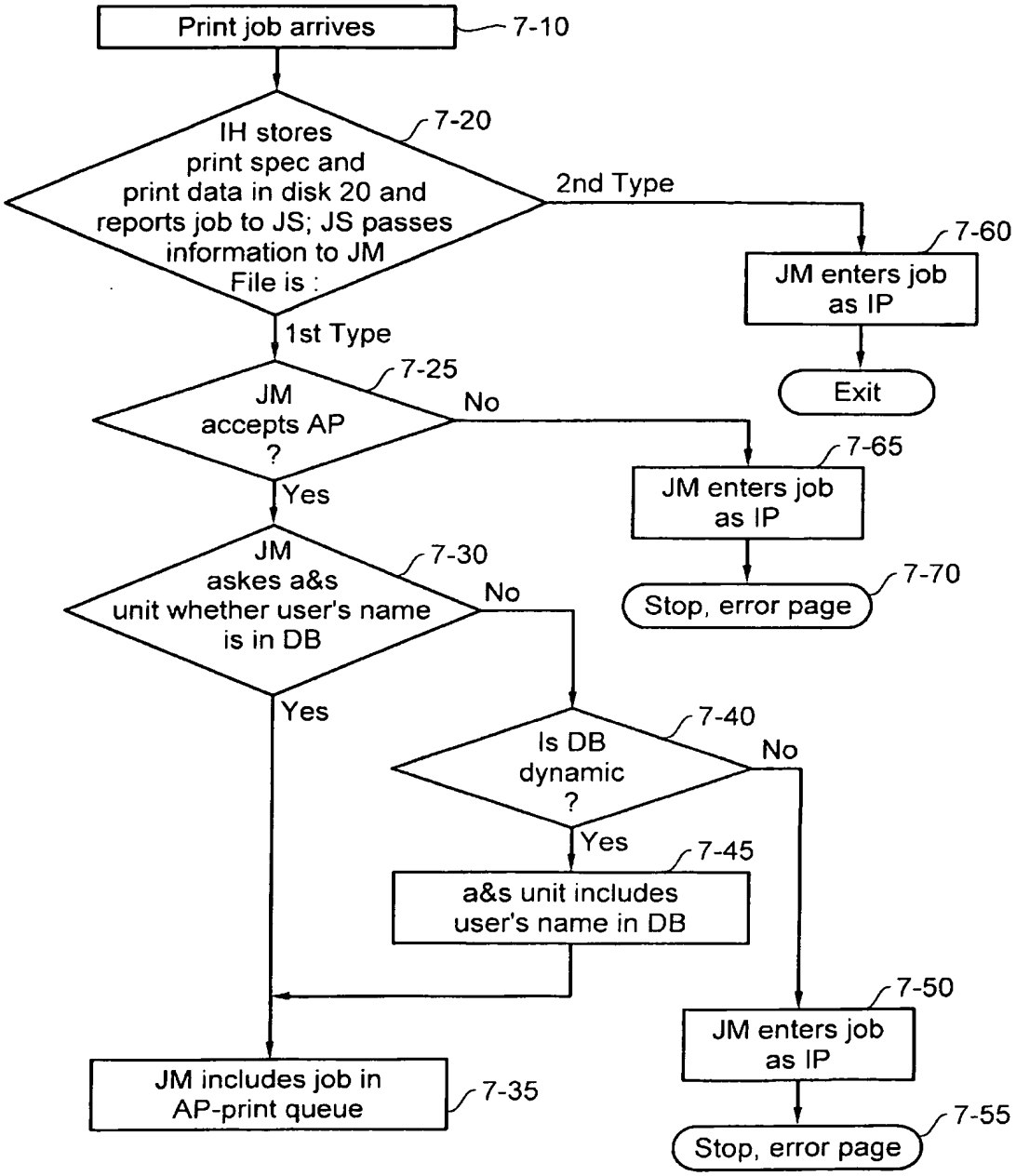

Print job arrives
7-10
IH stores print spec and print data in disk 20 and reports job to JS; JS passes information to JM File is :
7-20
2nd Type
7-60
JM enters job as IP
Exit
1st Type
JM accepts AP ?
7-25
No
7-65
JM enters job as IP
Stop, error page
7-70
Yes
JM askes a&s unit whether user's name is in DB
7-30
No
Yes
Is DB dynamic ?
7-40
No
Yes
a&s unit includes user's name in DB
7-45
7-50
JM enters job as IP
JM includes job in AP-print queue
7-35
Stop, error page
7-55

FIG. 7

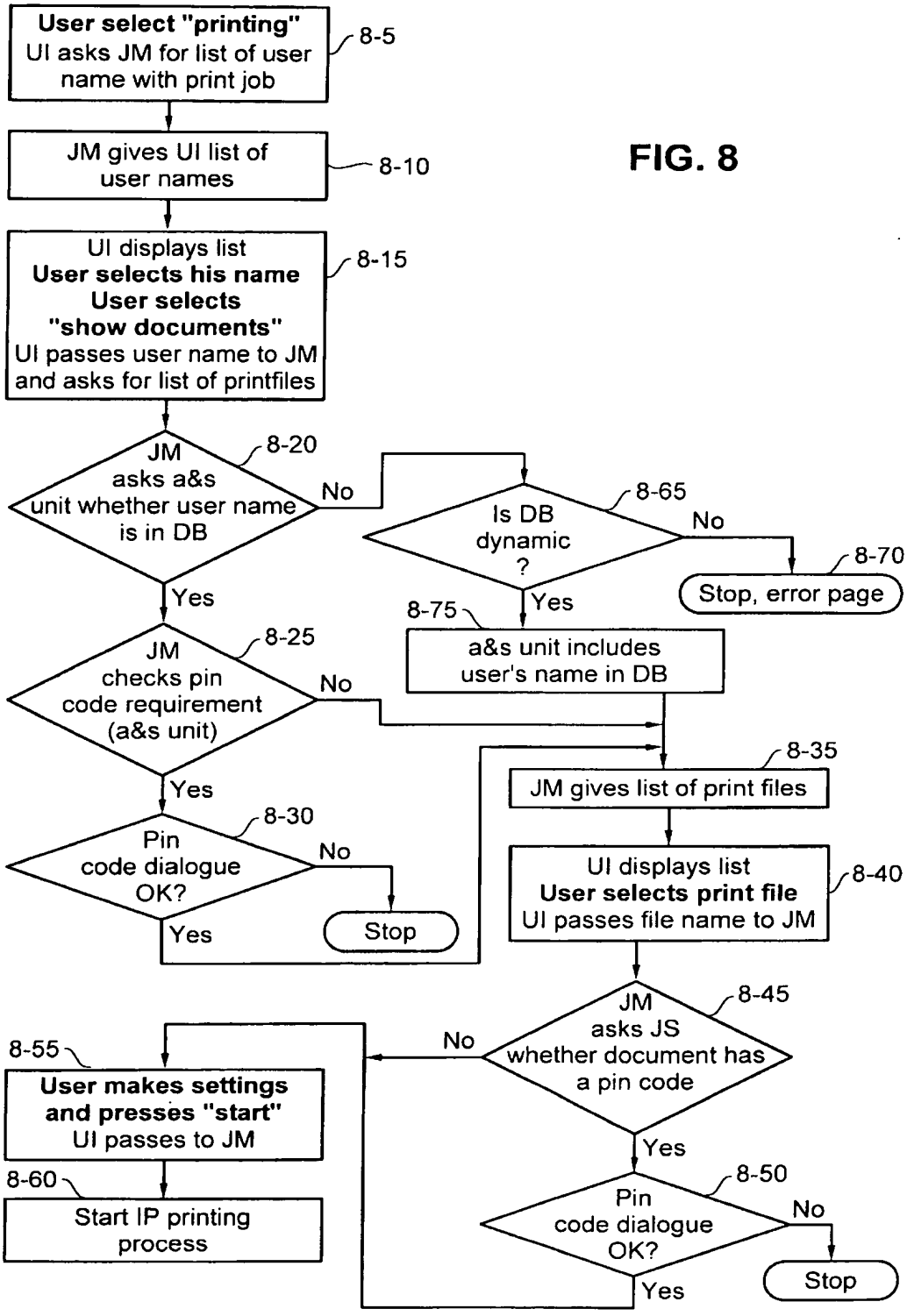
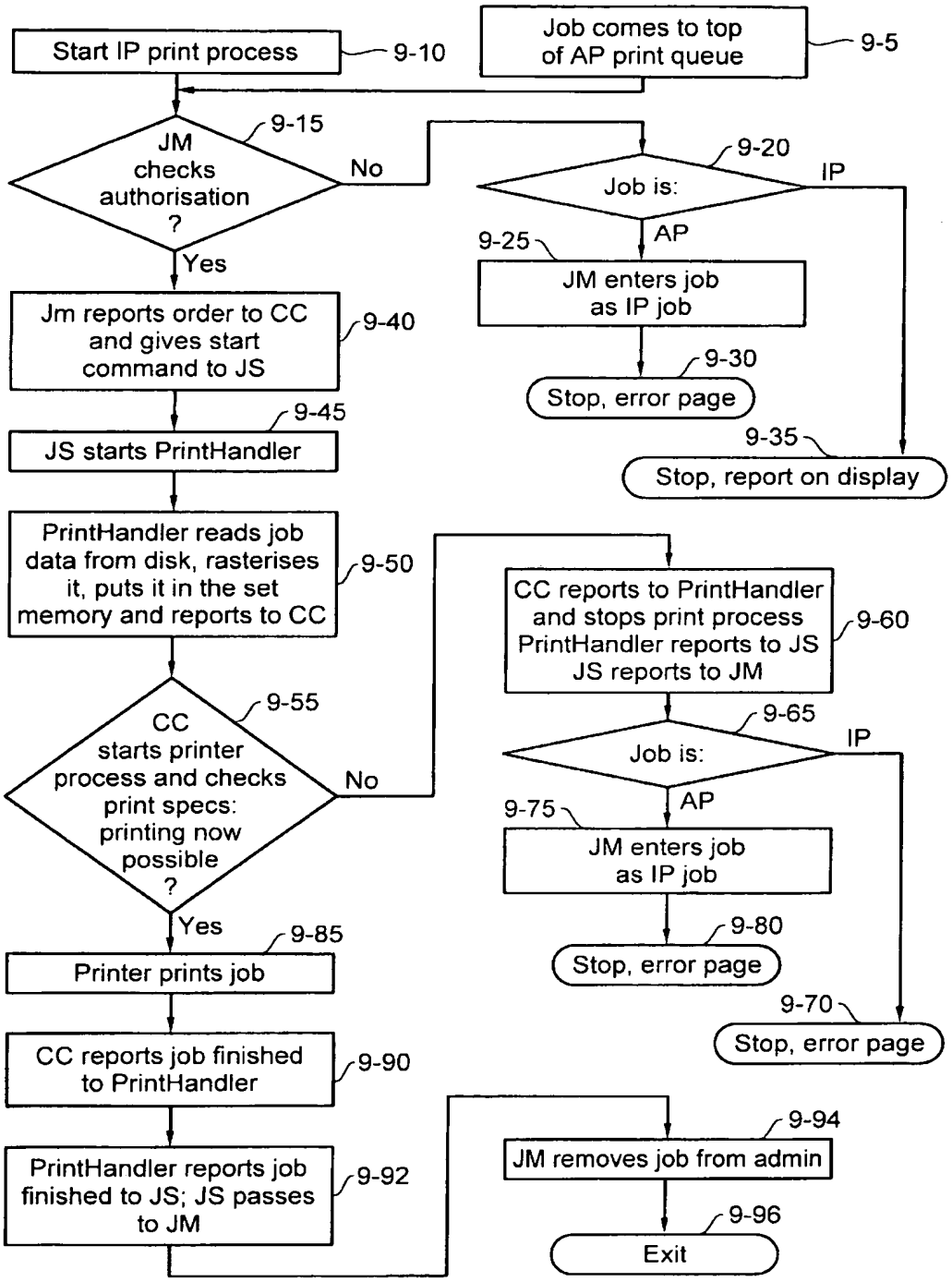

User select "printing"
UI asks JM for list of user name with print job
8-5
JM gives UI list of user names
8-10
UI displays list
User selects his name
User selects "show documents"
UI passes user name to JM and asks for list of printfiles
8-15
JM asks a&s unit whether user name is in DB
8-20
No
Is DB dynamic ?
8-65
No
Stop, error page
8-70
Yes
8-75
a&s unit includes user's name in DB
Yes
JM checks pin code requirement (a&s unit)
8-25
No
Yes
Pin code dialogue OK?
8-30
No
Stop
Yes
8-35
JM gives list of print files
UI displays list
User selects print file
UI passes file name to JM
8-40
JM asks JS whether document has a pin code
8-45
No
Yes
8-55
User makes settings and presses "start"
UI passes to JM
8-60
Start IP printing process
Pin code dialogue OK?
8-50
No
Stop
Yes

FIG. 8

FIG. 9


Start IP print process
9-10
Job comes to top of AP print queue
9-5
JM checks authorisation ?
9-15
No
Yes
Job is:
9-20
IP
AP
9-25
JM enters job as IP job
9-30
Stop, error page
9-35
Stop, report on display
Jm reports order to CC and gives start command to JS
9-40
JS starts PrintHandler
9-45
PrintHandler reads job data from disk, rasterises it, puts it in the set memory and reports to CC
9-50
CC reports to PrintHandler and stops print process PrintHandler reports to JS JS reports to JM
9-60
CC starts printer process and checks print specs: printing now possible ?
9-55
No
Yes
Job is:
9-65
IP
AP
9-75
JM enters job as IP job
9-80
Stop, error page
9-70
Stop, error page
Printer prints job
9-85
CC reports job finished to PrintHandler
9-90
PrintHandler reports job finished to JS; JS passes to JM
9-92
JM removes job from admin
9-94
Exit
9-96

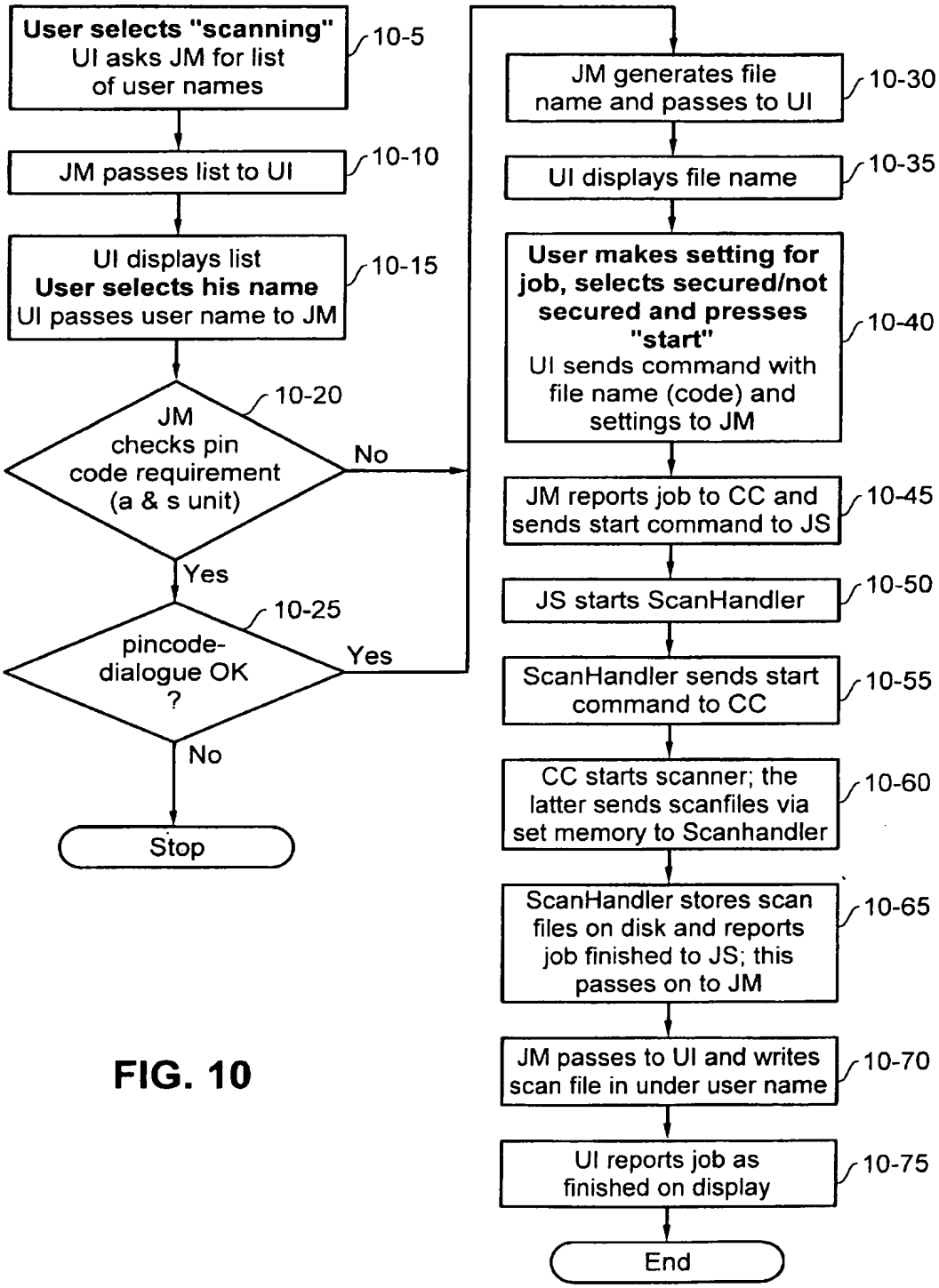

User selects "scanning"
UI asks JM for list of user names
10-5
JM passes list to UI
10-10
UI displays list
User selects his name
UI passes user name to JM
10-15
JM checks pin code requirement (a & s unit)
10-20
No
Yes
pincode-dialogue OK ?
10-25
Yes
No
Stop
JM generates file name and passes to UI
10-30
UI displays file name
10-35
User makes setting for job, selects secured/not secured and presses "start"
UI sends command with file name (code) and settings to JM
10-40
JM reports job to CC and sends start command to JS
10-45
JS starts ScanHandler
10-50
ScanHandler sends start command to CC
10-55
CC starts scanner; the latter sends scanfiles via set memory to Scanhandler
10-60
ScanHandler stores scan files on disk and reports job finished to JS; this passes on to JM
10-65
JM passes to UI and writes scan file in under user name
10-70
UI reports job as finished on display
10-75
End

FIG. 10

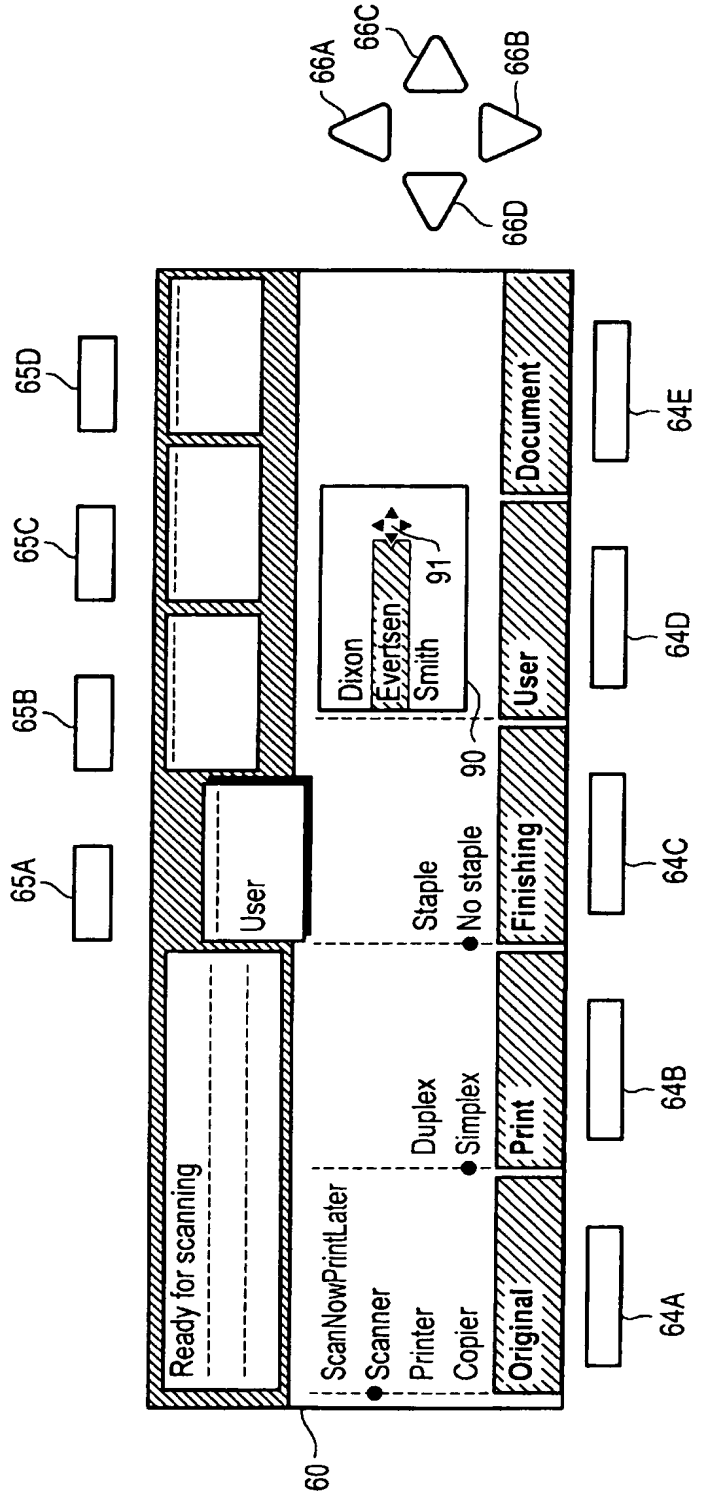

66A
66C
66B
66D
65D
65C
65B
65A
Ready for scanning
User
ScanNowPrintLater
Scanner
Printer
Copier
Duplex
Simplex
Staple
No staple
Dixon
Evertsen
Smith
91
90
Original
Print
Finishing
User
Document
64A
64B
64C
64D
64E
60

FIG. 11

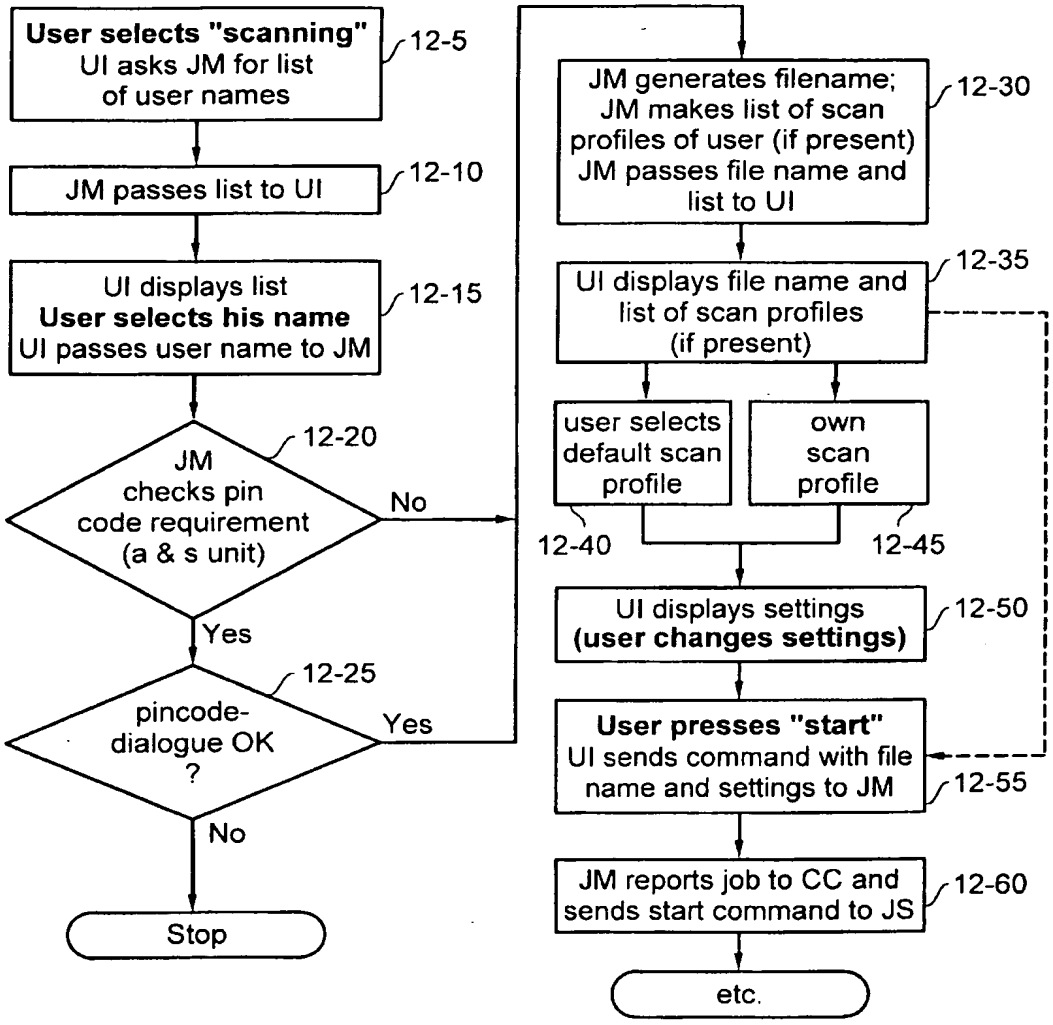

User selects "scanning"
UI asks JM for list of user names
12-5
JM passes list to UI
12-10
UI displays list
User selects his name
UI passes user name to JM
12-15
JM checks pin code requirement (a & s unit)
12-20
No
Yes
pincode-dialogue OK ?
12-25
Yes
No
Stop
JM generates filename; JM makes list of scan profiles of user (if present) JM passes file name and list to UI
12-30
UI displays file name and list of scan profiles (if present)
12-35
user selects default scan profile
own scan profile
12-40
12-45
UI displays settings
(user changes settings)
12-50
User presses "start"
UI sends command with file name and settings to JM
12-55
JM reports job to CC and sends start command to JS
12-60
etc.

FIG. 12

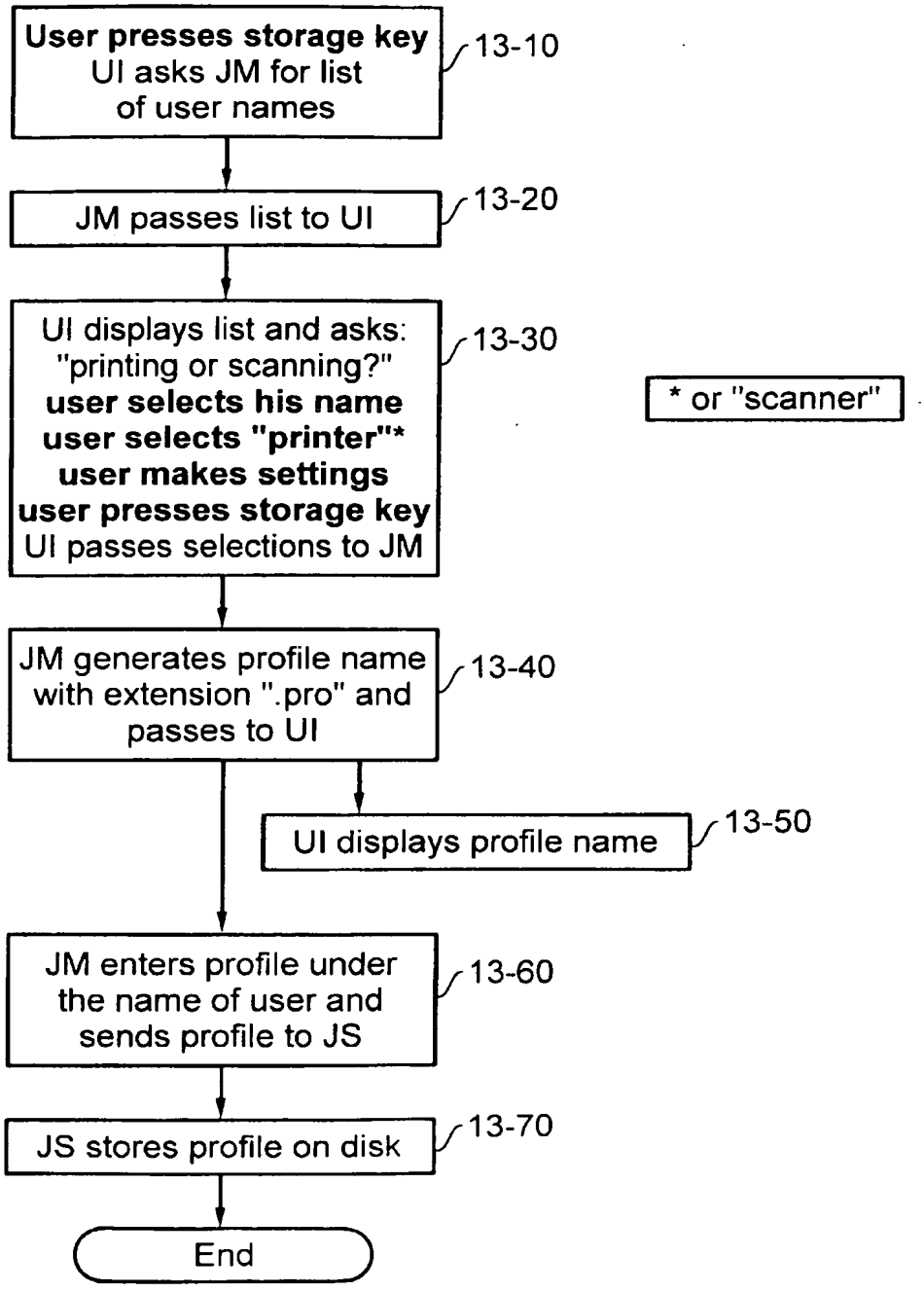

User presses storage key
UI asks JM for list of user names
13-10
JM passes list to UI
13-20
UI displays list and asks: "printing or scanning?"
user selects his name
user selects "printer"*
user makes settings
user presses storage key
UI passes selections to JM
13-30
* or "scanner"
JM generates profile name with extension ".pro" and passes to UI
13-40
UI displays profile name
13-50
JM enters profile under the name of user and sends profile to JS
13-60
JS stores profile on disk
13-70
End

FIG. 13

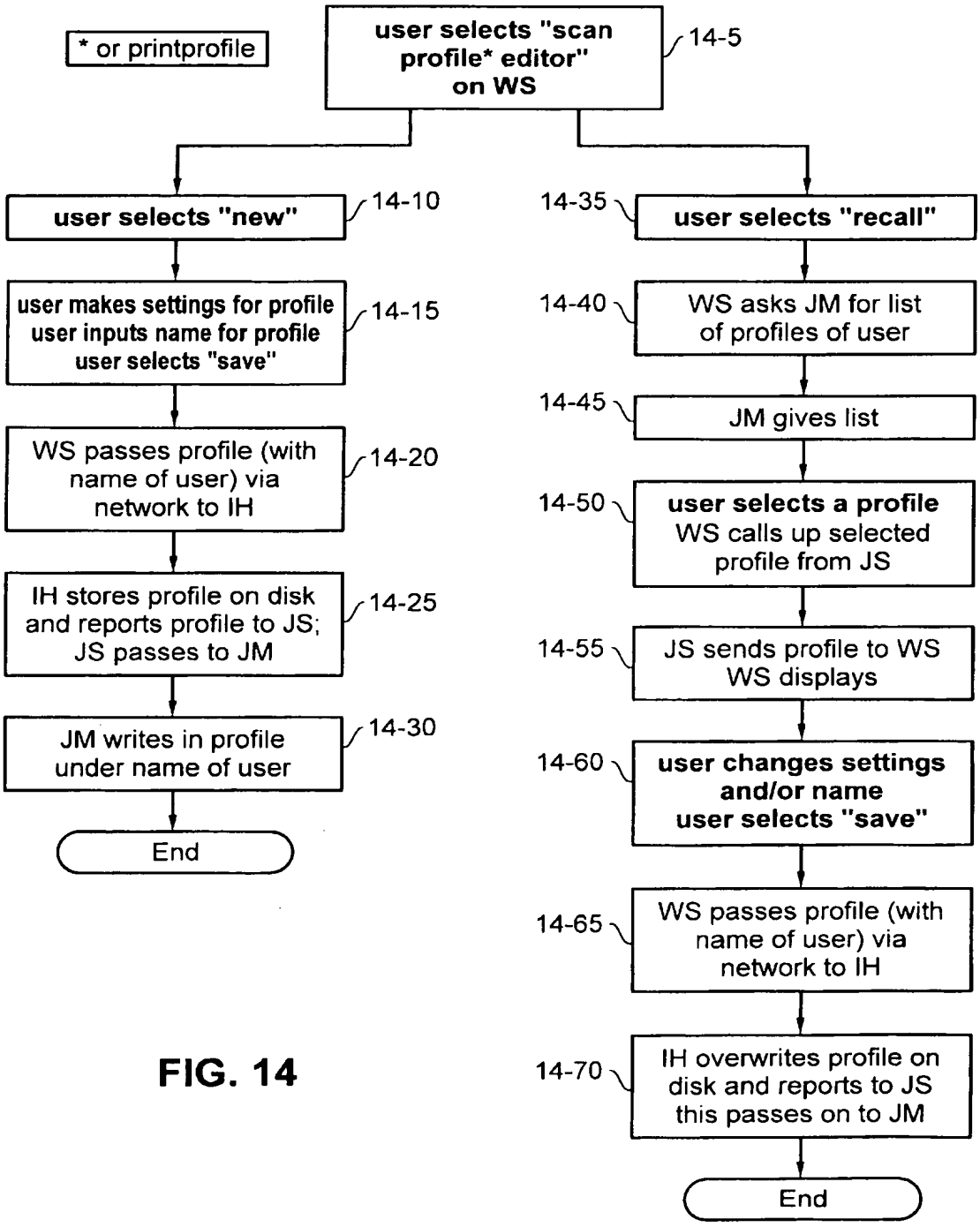

* or printprofile
user selects "scan profile* editor" on WS
14-5
user selects "new"
14-10
user makes settings for profile user inputs name for profile user selects "save"
14-15
WS passes profile (with name of user) via network to IH
14-20
IH stores profile on disk and reports profile to JS; JS passes to JM
14-25
JM writes in profile under name of user
14-30
End
14-35
user selects "recall"
14-40
WS asks JM for list of profiles of user
14-45
JM gives list
14-50
user selects a profile WS calls up selected profile from JS
14-55
JS sends profile to WS WS displays
14-60
user changes settings and/or name user selects "save"
14-65
WS passes profile (with name of user) via network to IH
14-70
IH overwrites profile on disk and reports to JS this passes on to JM
End

FIG. 14

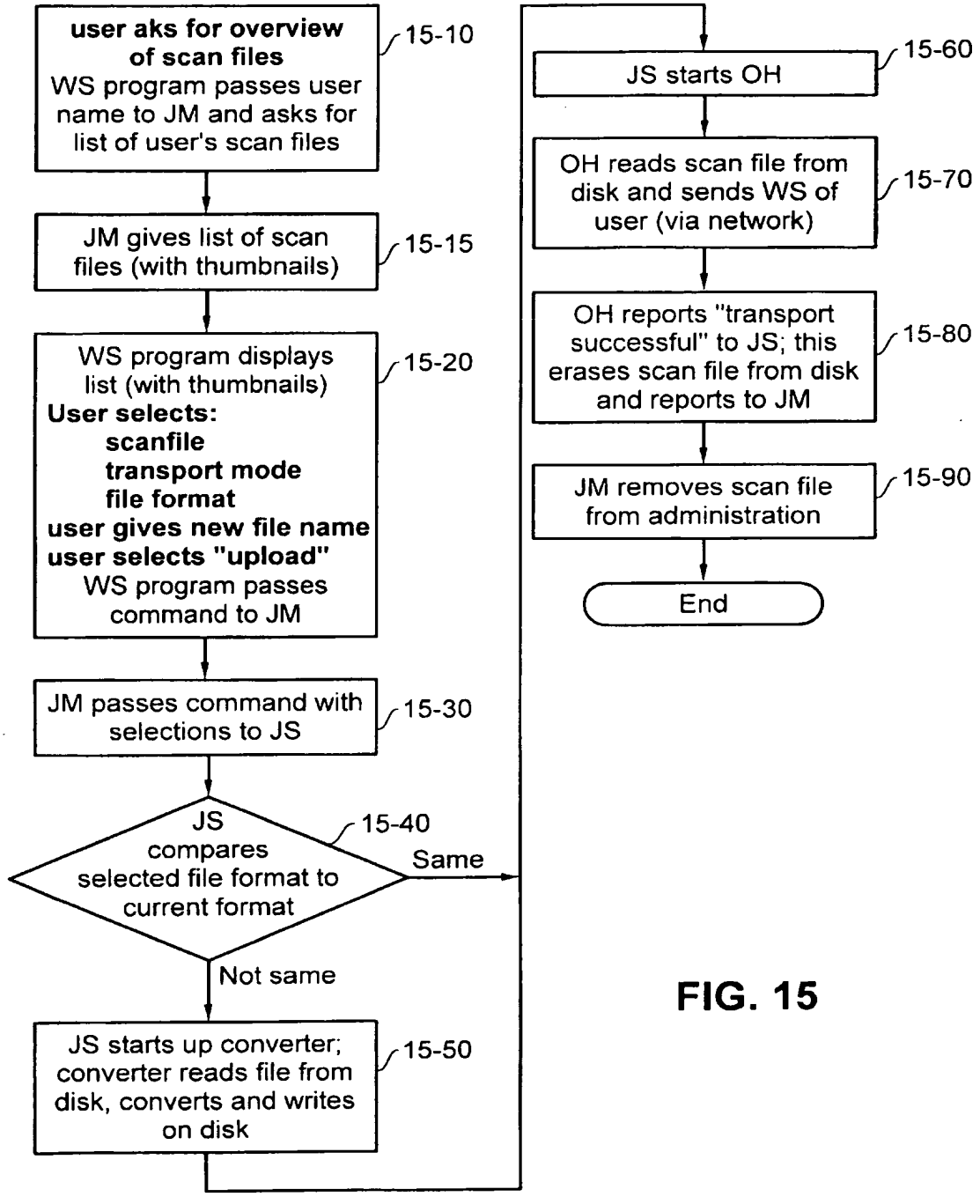

user aks for overview of scan files
WS program passes user name to JM and asks for list of user's scan files
15-10
JM gives list of scan files (with thumbnails)
15-15
WS program displays list (with thumbnails)
User selects:
scanfile
transport mode
file format
user gives new file name
user selects "upload"
WS program passes command to JM
15-20
JM passes command with selections to JS
15-30
JS compares selected file format to current format
15-40
Same
Not same
JS starts up converter; converter reads file from disk, converts and writes on disk
15-50
JS starts OH
15-60
OH reads scan file from disk and sends WS of user (via network)
15-70
OH reports "transport successful" to JS; this erases scan file from disk and reports to JM
15-80
JM removes scan file from administration
15-90
End

FIG. 15

DIGITAL COPYING APPARATUS WITH A PERSONAL DATA STORAGE SYSTEM

BACKGROUND OF THE INVENTION

1. Technical Field of the Invention

The invention relates to a digital image reproduction apparatus including a scanner unit, a printer unit, a memory, and an operator control unit integrated in the apparatus, the operator control unit being provided with an input device and a display that permit a user to give operator control commands to the apparatus. The invention further relates to such a digital reproduction apparatus that includes a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users, and a management unit connected to the scanner unit, printer unit, memory and network connection unit, and, via the network connection unit, to the workstations.

2. Description of Related Art

Reproduction apparatuses of the kind described above are generally known. Such apparatuses can be used for copying documents and for printing digital image data files made in a workstation.

Scanner devices are also known which are coupled to a network and which can send digital data files generated during scanning to a pre-programmed address on the network, usually a workstation of a user.

A network is provided with one or more fileservers which provide interim storage and retention of the digital data if a destination address does not answer because the apparatus connected thereto is not ready for reception or possibly not even switched on. A data file is thus first sent from the dispatch address via the network to the fileserver and then from the latter to the destination address.

A number of problems can arise with such conventional systems, particularly if the files sent are large. First of all, a file is sent over the network twice so that the load on the network and the file server is relatively large. Secondly, if an apparatus coupled to a reception address is not ready for reception, the files are stored on the file server disk, which can thus fill up, so that the functioning of the entire network is obstructed or even made impossible. Thirdly, in a scanning process, when the disk of the receiving workstation becomes full, the scanning process has to be terminated, and this obstructs the progress of the work.

In addition, data traffic monitoring by the owner of the data files may be inadequate, on the one hand because print files are printed immediately even if he is not present, and secondly scan files are immediately available at his workstation even if he is not present.

It is therefore desirable to more effectively monitor the traffic of digital image data from and to the reproduction apparatus so that the above problems are eliminated or at least so reduced that they do not obstruct the functioning of the entire digital network.

SUMMARY OF THE INVENTION

To this end, in the apparatus according to the invention, the management unit maintains logic storage space in the memory, each allocated to a specific user, wherein the management unit, when receiving from a said user's workstation a digital data file for printing, stores the file in the logic storage space of the relevant user and passes it for printing to the printer unit only on a command from the operator control unit, which command identifies the relevant file, and also, on receipt from the operator control unit of an order for scanning, such order being provided with a user identification, stores the digital data generated by the scanner unit in executing the job in the logic storage space of the relevant user and passes it to a workstation of the relevant user only on a command from the latter workstation, which command identifies the relevant file.

In this way, data traffic between the digital environment and the apparatus is decoupled in time. This means that a permanent coupling between the making and sending of a file for processing, and the processing of that file, is eliminated, and the files are kept in a safe place in the apparatus, this place being coupled or otherwise associated with a particular person, until they are actively called up from the destination address. This means that the user, when making or sending files, need not be concerned with the time and circumstances of the processing of his files.

In addition, the owner of a file retains control thereof, because its transport takes place only in his presence at the reception point. The buffer point can also be secured so that only the owner of the buffer can access the files stored therein.

The term "user" in this context also includes an application program or (the control program of) a peripheral, if such a program is aimed at generating or processing a data file.

It should also be noted that the term "workstation of a user" means a workstation running a program personalized for that user.

It should be noted that Applicants' patent application EP-A 0 689 157 already describes a printing apparatus which never directly prints a print file received from a digital environment, but stores it internally under the owner's name and does not print it until a command for this purpose is given from the apparatus operator control panel, said command identifying the file. The idea of storing a print file and only releasing it on a specified command is now expanded in the present invention to a concept of logic storage spaces accessible only to the relevant user, in which not only print files, but also all kinds of other files, primarily scan files, can be stored, but always in such manner that a stored file has to be actively brought up from its destination from a logic storage space of this kind.

Particularly for scan jobs this concept of logic storage spaces in the apparatus has the advantage that a file is sent over the network just once and hence subjects the network and the file server to less loading. In addition, scan files remain in the apparatus until a user brings them up to his workstation. If so many digital data are generated that the disk becomes full, that disk is the apparatus disk (the memory). As a result this disk may break down, but that does not obstruct the action of the file server and the network, so that in any case the communication between the users of the network is not obstructed. Finally, the problem of the limited storage capacity of the workstation is effectively solved, because the user will only bring up as many files as his workstation can process, and he can leave the rest waiting in the apparatus memory.

Other files which can be kept in the logic storage spaces are sets of settings of parameters for controlling the apparatus which have been made by the operator on the operator control panel prior to a printing or scanning process. These can be made by means of the operator control panel or by means of a special program running on a workstation, stored in the personal logic storage space of the user, and be brought up therefrom to control the apparatus.

The logic storage spaces may have the form of a directory structure in the memory, but also, for example, the form of

entries in a database. Of course the management unit which manages the logic storage spaces is provided with an administration system for the logic storage spaces and their contents.

According to one embodiment of the apparatus according to the invention, the management unit, on receiving from a workstation a digital data file for printing, such file being provided with a user identification, checks whether it already manages a logic storage space for the relevant user, and if that is not the case, the management unit creates a logic storage space for the relevant user and stores therein the received digital data file. The creation of logic storage spaces can also take place in response to a program start up at a workstation intended for communication with the apparatus and reporting to the management unit on start-up.

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention, and wherein:

FIG. **1** illustrates an apparatus according to the invention;

FIG. **2** is a diagram showing the constituent parts of an apparatus according to the invention;

FIGS. **3** and **4** illustrate an apparatus operator control panel, according to the invention, in various situations;

FIGS. **5A** and **5B** are flow diagrams to explain the operation of the inventive apparatus accounting and security unit;

FIG. **6** is a flow diagram of an inventive process for making a copy;

FIG. **7** is a flow diagram of an inventive reception process for print files;

FIG. **8** is a flow diagram of the initial procedure of an interactive printing process according to the invention;

FIG. **9** is a flow diagram of a printing process according to the invention;

FIG. **10** is a flow diagram of a scan process according to the invention;

FIG. **11** illustrates the operator control panel according to the invention;

FIG. **12** is a flow diagram of a scan process using a scan profile according to the invention;

FIGS. **13** and **14** are flow diagrams of a procedure for making a scan profile according to the invention; and

FIG. **15** is a flow diagram of a procedure for fetching a scan profile from the apparatus according to the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. **1** shows the apparatus according to the invention, on which the different parts are separately shown in diagram form.

The document feeder **110** is provided with an input tray **111** for the introduction of a stack of documents, a transport mechanism (not shown) for transporting the documents one by one along the scanner unit **120**, and a delivery tray **112**, in which the documents are placed after scanning.

The scanner unit **120** includes a flat bed scanner provided with a glass platen on which an original document can be placed, a CCD array and an imaging unit having a movable mirror and lens system for imaging the document on the CCD array. In these conditions, the CCD array generates electrical signals which are converted into digital image data in manner known per se.

The printer unit **130** includes an electro-photographic processing section known per se, in which a photoconductive medium is charged, exposed via an LED array in accordance with digital image data, and is developed with toner powder, whereafter the toner image is transferred and fixed on an image support, usually a sheet of paper.

A stock of image supports in different formats and orientations is available in the supply section **140**.

The image supports with the toner image are transported to the finishing and delivery section **150**, which if necessary collects them into sets and staples them and then deposits them in the delivery tray **151**.

An operator control panel **160** is provided on the apparatus for operation thereof. It is provided with a display and keys and is connected to an operator control unit (not shown here).

The control electronics are shown diagrammatically by reference **170**. A cable **171** connects this section of the apparatus to a local network **10** (not shown here).

FIG. **2** is a diagram showing the constituent parts of the apparatus according to the invention.

The apparatus **1** comprises a basic unit **2** which contains a scanner unit **3**, a printer unit **4**, a set memory **5** and a control unit **6** for these units, hereinafter termed the Copy-Controller.

The basic unit **2** contains the units and functions required for making a simple copy. During the scanning of an original document, the scanner **3** generates digital image data and stores them in the set memory **4**, whereafter the printer **5** reads out the image data from the set memory **4** and prints them on an image support, usually a sheet of paper. This process is controlled by the CopyController **6**. The set memory **4** in this description also includes an image processing function, although this is not essential to the present invention and is therefore not explained further.

The apparatus **1** also includes a number of units required to print digital image data which are fed via a local network **10** from a digital environment, and for exporting digital image data generated by the scanner **3** to the digital environment via the same local network **10**.

The term "digital environment" as used here denotes one or more workstations **11***a*, **11***b*, **11***c*, on which a program is operative for communication with the apparatus according to the invention, and which are also connected to the local network **10**.

The apparatus **1** is provided with:

- a management unit **12**, hereinafter referred to as the: JobManager, which manages the processing processes and also updates an administration system for all the copying, scanning and print jobs present,
- an operator control unit **13**, also termed a: UserInterface (UI), provided with an operator control panel on the apparatus housing, with a display and keys for operation of the apparatus **1**,

an InputHandler **15** for receiving and transmitting digital data reaching the apparatus via the network **10** from the digital environment and an OutputHandler **16** for sending digital data via the network **10** to the digital environment,

a storage unit **20** formed by a high-capacity hard disk, a unit **21** hereinafter referred to as a JobServer for managing the data files on the storage unit **20** and for controlling the processing processes,

a control unit **25** hereinafter referred to as a PrintHandler, which is dedicated to providing a printing process, and a control unit **26** hereinafter referred to as a ScanHandler, which is dedicated to providing a scanning process,

an accounting and security unit **27**, which inter alia manages the authorization of users and access codes,

a conversion unit **28** for converting digital data files to different formats.

FIG. 2 shows control connections by means of thin arrows and data transport connections by means of thick arrows.

The JobManager **12** is connected to the operator control unit **13**, the JobServer **21**, the CopyController **6**, the accounting and security unit **27** and, via the network **10** and the InputHandler **15** and OutputHandler **16**, to the workstations **11***a–c*. The latter connection is indicated diagrammatically by direct broken-line arrows. Apart from being connected to the JobManager **12**, the JobServer **21** is also connected to the storage unit **20**, the InputHandler **15**, the OutputHandler **16**, the PrintHandler **25**, the ScanHandler **26** and the conversion unit **28**. The CopyController **6** is connected to the scanner unit **3**, the set memory **4** and the printer unit **5**, and also to the JobManager **12**, the PrintHandler **25**, the ScanHandler **26** and the accounting and security unit **27**.

Digital data files which are sent to the apparatus **1** via the network for printing are either of a first type or a second type. Files of the first type are required to be printed directly, i.e. without further action on the part of an operator at the apparatus, while files of the second type are required only to be stored in the memory of the apparatus and not to be printed until an operator explicitly so requests at the apparatus by selecting via the operator control panel. The type of file involved is apparent from an attribute added to the file.

Processing of a data file of the first type is referred to in this description as automatic printing (AP).

Processing of a data file of the second type is referred to as interactive printing (IP). The procedure with this is as follows (see FIG. 2).

A second type data file for printing sent by a workstation via the network is received by the InputHandler **15**. The latter extracts from the file a number of predetermined identification data and passes such data to JobServer **21**, which in turn transmits the data to JobManager **12**. In this example, the extracted identification data include the name of the owner and the name of the file itself. The file is then stored unchanged in the storage unit **20**, whereafter the apparatus passes into the standby mode.

JobManager **12** manages an administration system in which the identification data of all the data files for printing stored in the storage unit **20** are entered. If a new file is supplied via the network, then the JobManager **12** adds the identification data thereof in connection with the name of the owner/sender to the administration system.

The storage unit **20** together with the administration system of the JobManager **12** form, as it were, a set of "logic storage spaces" for data files, each logic storage space being allocated to one user. Thus in actual fact storage in the user's logic storage space means that the file is stored in the storage unit **20** and entered in the administration system in connection with the name of that user. A logic storage space can be protected by a code specific to the owner/user, and in practice this means that an operator can only obtain information concerning the files stored in a specific logic storage space after he has input this code.

There can also be one or more logic storage spaces for general use which are not protected by a code, so that everyone has access to that logic storage space. All kinds of files used by numerous users, for example specific forms, can be stored in a public storage space of this kind.

The manager of the apparatus can set the JobManager **12** so that it does not accept any print jobs which are required to be printed immediately (files of the first type or AP). In that case, the JobManager automatically converts such jobs into interactive print jobs (IP) and stores the data file in storage unit **20** in the form of files of the second type.

When an operator wants to have a specific data file of the second type printed, he must give a command for this via the apparatus operator control panel **160**. In response to this, the data file is brought out of the storage unit **20** and converted to printable data by the PrintHandler **25**, and after intermediate storage in the set memory **4** the data are processed by the printer unit **5** to produce a print. A print file of the second type can be protected with a code by the sender. This code has the form of an attribute to the print file. If a user wants to print this file interactively, he must input the security code on the operator control panel before the file is printed.

When a data file of the second type has been printed, it remains in principle stored in the storage unit **20** until it is removed by the user himself or the manager of the apparatus. To this end, he gives a command for removal of a selected file. In response to this the JobManager **12** passes a command to the JobServer **21** to erase the intended file from the storage unit **20** and it removes the identification data of that file from its administration system.

The operator control panel **160** belonging to the operator control unit **13** is shown in FIG. **3** and includes a display screen **60**, such as an LCD display, and a number of keys, namely a start key **61**, number keys **62**, correction key **63**, storage key **67** and selection keys **64**A E, **65**A–D and the key cluster **66**A–D. All these elements are connected to the operator control unit **13**, which in response to operation of the keys passes signals to the JobManager **12** and which also controls the display screen **60** to display options and messages to the operator.

When the apparatus has been switched on, the display screen **60** displays an image formed by a number of vertical columns, each situated above one of the selection keys **64**A E. Each column relates to a specific basic function of the apparatus and shows the different possible settings for that basic function. For example, the furthest left column is allocated to the choice between a copying function, in which a document is scanned by the scanner and then reproduced, a printer function for interactive printing, in which a print is made using a data file of the above-mentioned second type sent using the network for printing, a scanner function, in which a document is scanned while generating a scan file that can then be fetched by a workstation, and a deferred copying function ("scan now-print later"), in which a document is scanned while generating a print file of the second type which is stored in the storage unit of the apparatus and can be printed with the printer function. The setting selected at any time, the copying function in this case, is indicated by a marker, such as a dark dot, or by highlighting.

By actuating a selection key an operator can choose a different setting, e.g. in accordance with a cyclic pattern. As

a result of a change of a setting the function of one or more of the other selection keys may change, because the old function is no longer relevant and other selection options are required. Different text relating to the new function then appears in the associated column of the display screen **60**.

The selection keys **65**A–D offer the possibility of bringing up a different set of functions which cannot be displayed by the restricted dimensions of the display screen **60**. These are generally functions which are not required for a simple copying or print job, but which offer the operator more options to obtain special printing results. In this example, these functions comprise shifting the margin on the print, adding covers, and originals per copy. The meaning of the keys **65**A–D is indicated in an associated field in the display screen **60** directly beneath each key. When one of the keys is actuated the corresponding set of functions is activated and the layout of the display screen **60** is adapted to the associated functions. At the same time, this selection is displayed by framing or otherwise making conspicuous that field on the display screen **60** which belongs to the actuated key of the group **65**A–D.

The operator control panel **19** also contains a number display **70** to indicate the number of prints set, as is generally customary on copying machines.

If the printer function has been selected by key **64**A in the "basic settings" group, the columns above the keys **64**B (simplex or duplex, both in respect of the original document and the copy sheet), **64**C (stapling) and **64**D (the choice of format of the print paper) relate to the finishing of the copying job and the column above key **64**E relates to light/dark control for the copy.

FIG. **4** shows the layout of the display screen **60** after the printer function for interactive printing of data files of the second type has been selected by key **64**A in the group "basic settings". In this case the keys **64**D and **64**E now have the function of specifying the data file for printing by selection of users and file name. Different files of the second type, from different users, may in fact be stored in the memory. All these files are entered in the administration system of the JobManager **12**, as described above, and can be displayed on the display screen **60** for selection.

After actuation of key **64**D, an operator can select a user name from the list of users who have sent one or more files, and after actuation of key **64**E a file name can be selected from the list of files sent by the selected user.

In response to the actuation of key **64**D the column on the display screen above this key is provided with a frame **90** and a star symbol **91** to show that a user name can be selected and the star keys **66**A–D are active for that selection. As a preselection, the name of the user who last sent a file to the machine is automatically selected as the name.

The pair of keys **66**A/B is used to proceed alphabetically through all the user names in the list, forwards with key **66**A and backwards with key **66**B. If there are more names than can be displayed simultaneously in the frame **90**, then as many names as fit within the frame are displayed and the whole list is automatically scrolled through. A bar having text therein in reverse video indicates what name has been selected.

In response to actuation of key **64**E, the column of the display screen above that key is provided with a frame and a star symbol in exactly the same way as the procedure on actuation of key **64**D as described above, in order to indicate that a file name can be selected and that the star keys **66**A–D are active for that selection. The selection with the star keys is exactly the same as to that involved in the selection of a user name. The last file sent is selected, for example, as a preselection.

After selection of a file, the printing process is started by actuating the start key **61**.

The operation of the accounting and security unit **27** will now be explained by reference to FIG. **5**A and FIG. **5**B. This unit both controls access to the copying, scanning and printing, and the accounting for copies, scans and prints made. It has available a database in which an entry can be made for each user by the apparatus manager. For a user, a user code (hereinafter referred to as the "PIN" code) is stored at his user name and a total to which is added the copies and prints made. Each user name also has an authorization code stored to determine the authorization of the relevant user to make use of the apparatus. This can be set up by the apparatus manager, so that access can, for example, be occasionally denied. The authorization can also be automatically denied to a specific user if, for example, a predetermined credit has been used up.

FIG. **5**A describes the case in which a user makes a copy or print at the apparatus. In that case he must first input his user code with the number keys on the operator control panel (**5-1**). If the code is correct (**5-2**), the accounting and security unit **27** checks the authorization (**5-3**). And if this is also in order then the relevant user may make his copies, scans or prints (**5-4**) and these are added to the user's total usage. If either the user code is incorrect or the user is not authorized, then the unit **27** refuses to release the apparatus for use and reports this on the display on the operator control panel (**5-5**).

FIG. **5**B describes the case in which a user sends a digital data file from his workstation to the apparatus for immediate printing. The task of the accounting and security unit **27** then includes, first, checking whether the user name, which always forms part of the data file, occurs in the database (**5-11**).

If the database does not contain the user's name for a received print file, then the accounting and security unit **27** makes a new entry in the database (**5-15**) for this user's name, with an automatic authorization. The mode in which the accounting and security unit **27** does this is hereinafter referred to as the "dynamic mode". It may be that the accounting and security unit **27** has been brought into a different mode, hereinafter referred to as the "static mode", by the apparatus manager, in which case the user's name is not added to the database and the print job is automatically not carried out (**5-16**). This first treatment is indicated in FIG. **5**B in a block I having a broken-line frame.

If the check in block I has a positive result, then the authorization is checked (**5-12**) and if it is also in order then the print file is processed further (**5-13**), the prints being added to the user's total usage.

The access system of the accounting and security unit **27** can also be switched off so that anyone can without difficulty copy, scan and, from a workstation, print. In relation to a print job from the operating control panel on the apparatus, the access system remains partially active, namely for protecting individual print files, as will be described hereinafter.

Copying

FIG. **6** shows the procedure for making a copy. It is assumed in this case that the access system of the accounting and security unit **27** is switched on.

At the start of the process (**6-10**), the apparatus is in the "copying" mode or the operator selects that mode with key **64**A on the operator control panel **160**. The operator control unit **13** now waits for a user code and when the operator inputs this passes it through to the JobManager **12** (**6-20**). By using the accounting and security unit **27** the JobManager **12** checks the authorization of the relevant user (**6-30**). If this

is not in order, then the JobManager refuses to make a copy and reports this on the display on the operator control panel **160** (**6-40**).

If the authorization is in order, then the operator can start copying, by making settings for the process on the operator control panel, placing documents in the input tray **111** of the document feeder **110** and actuating the start key **61** (**6-50**). The settings and the start command are then transmitted by the operator control unit **13** to the JobManager **12**.

If the access system of the accounting and security unit **27** was switched off, then step **6-50** immediately follows step **6-10**.

The JobManager **12** then gives a command to the CopyController **6** to activate the various parts of the apparatus (**6-60**). On the command of the CopyController **6** the scanner unit **3**, including the document feeder **110**, is now started to scan documents one by one and pass the digital data thus generated to the set memory **4**, and the printer unit **5** is started to read the digital data out of the set memory **4** and print them on sheets of paper (**6-70** and **6-80**).

When all the documents have been scanned and printed, the CopyController **6** reports the job finished to the JobManager **12** (**6-90**) and the copying action is completed.

Reception of a Print File

FIG. **7** is a description of the procedure on the arrival, via the network, of a data file of the first or second type for printing.

The relevant data file is received by InputHandler **15** (**7-10**). This extracts identification data (including the name of the user and of the file) and print specifications (e.g. printing and finishing parameters), determines whether it is a print file of the first (AP) or of the second (IP) type, reports the job to the JobServer **21** and stores the entire file, i.e. the print specifications and the image data for printing, in the storage unit **20** (**7-20**). The JobServer **21** in turn reports the job, with the relevant data, to the JobManager **12**.

If the print file is of the second type, the JobManager enters the job as such in its job administration system (**7-60**), whereafter no further activities take place in respect of this job.

If the print file is of the first type, the further handling (**7-25**) thereof depends on whether the JobManager **12** is in the mode in which it accepts automatic print jobs (AP). If not, the JobManager enters the print job in its job administration system as being an interactive print job IP and does not pass to direct printing (**7-65**). A print-out can be made, however, giving the reasons why the job has not been carried out (**7-70**).

If the JobManager **12** is in the mode in which it does accept automatic print jobs, it calls in the accounting and security unit **27** to determine whether the job can be processed (**7-30**). The accounting and security unit **27** proceeds as described in connection with block **I** in FIG. **5B**. If this check (**7-40**) shows that the file may not be printed, then the JobManager enters the print job (**7-50**) in its job administration system as being an interactive print job (IP) and does not pass to direct printing. A message can be printed out on a sheet of paper, however, giving the reasons why the job has not been carried out (**7-55**).

If the check by the accounting and security unit **27** proves positive, the JobManager includes the job in the print queue (**7-35**) for automatic print jobs (AP-queue), where it has to wait its turn for processing.

Interactive Printing

FIG. **8** shows the course of events when a user gives an interactive print order with the aid of the operator control means on the apparatus operator control panel.

The user will start by selecting the print function (**8-5**) with key **64A** (FIG. **3/4**). The operator control unit **13** then passes a request to the JobManager **12** to pass a list of all the users who have sent a print job of the second type that has not yet been processed. In response to that request, the JobManager makes up a current list and passes it to the operator control unit **13** (**8-10**).

The operator control unit displays this list on the display, in the column above key **64D** (FIG. **4**), whereafter the user can select his name. After the user has done this, he actuates key **64E** to obtain an overview of his own print jobs. In response to this, the operator control unit **13** gives the selected user's name and a request for a list of print jobs of that user to the JobManager (**8-15**).

The JobManager now asks (**8-20**) the accounting and security unit **27** whether the relevant user's name occurs in its database. The unit **27** then proceeds as described in connection with block **I** in FIG. **5B**. If the name really does occur in the database, the JobManager asks the accounting and security unit **27** whether there is a user's code for this user's name (**8-25**), and, if so, it conducts a dialogue with the user through the agency of the operator control unit **13** in order to check the user's code (**8-30**). If the result is positive, the JobManager makes up a current list of interactive print jobs (**8-35**) of the relevant user and passes it through to the operator control unit **13**, which submits this list to the user for selection on display **60**.

The user now selects a print file (**8-40**) the name of which is transmitted by the operator control unit **13** to the JobManager **12**, which in turn asks (**8-45**) the JobServer **21** whether a security code was sent with the selected file. If so, then through the agency of the operator control unit the JobManager again carries out a dialogue (**8-50**) with the user to check the code. If the result is positive, the JobManager releases the file for printing, and the user can set finishing parameters on the operator control panel (**8-55**), whereafter the user can start the printing process (**8-60**) by actuating the start key **61**.

If a user has sent a number of print files each provided with a security code and then wants them all printed interactively, then after a first print file the JobManager in the case of a subsequent print file tries out whether the security code of the preceding protected file is also valid for the current file and will start a new check dialogue with the user only when the current file has a different security code. In this way a user can work faster if he gives a series of print files the same security code. For printing he then only needs to input the code the first time. The use of a single security code is also convenient because the user does not then have to remember a number of different codes.

This procedure is explained by the following example. Let us assume that a user has sent the following series of print files to the apparatus for interactive printing:

File **1**, security code **123**
File **2**, security code **123**
File **3**, no security code
File **4**, security code **123**
File **5**, security code **456**
File **6**, security code **456**
File **6**, security code **123**

If the user now selects the files consecutively for printing at the apparatus, he must input the code **123** at file **1**, whereafter the JobManager releases the document for printing. File **2** is automatically released because the code of file **1** is also valid for this. File **3** has no security code and is therefore printed without checking. File **4** has the same security code as the preceding protected file, and is therefore

automatically released also. File **5** has a different security code, and here the user must again input a code, whereafter file **6** is automatically released. Finally, another code has to be input for file **7**, because although this security code was used previously, it is not the code of the preceding protected file.

Printing Process

FIG. **9** shows the progress of the printing process started either by the JobManager **12** when a print job of the first type (AP) reaches the head of the AP queue (**9-5**), or by the user as an interactive print job (IP) (**9-10**). It should be noted here that the JobManager is so programmed as to be able to start an automatic print job only if no activity has been observed on the operator control panel for a predetermined time, e.g. **30** seconds. This prevents a user occupied in a job at the operator control panel from being disturbed by the sudden start of an automatic print job.

If the access system of the accounting and security unit **27** is switched on, the JobManager now first checks the authorization (**9-15**) of the relevant user (the owner of the print job). If the authorization is not in order, the process is interrupted (**9-20**). If the print job is an automatic print job, the JobManager records the print file as being of the second type (**9-25**) and does not print it (**9-30**). It is possible to make a print giving the reasons why the job has not been carried out In the case of an interactive print job, the JobManager refuses the order and displays (**9-35**) a report thereof on the display at the operator control unit **13**.

If the user is authorized, the JobManager reports the print job to the CopyController **6** and gives a start command (**940**) for this order to the JobServer, which in turn starts up (**9-45**) the PrintHandler **25**, so that the latter reads the relevant print file from the storage unit **20**, rasterizes it, and stores it (**9-50**) in the set memory **4**. On a report from the PrintHandler to the CopyController **6** to the effect that sufficient image data are stored in the set memory, the CopyController starts (**9-55**) the printer unit **5** to make a print.

In this connection (**9-55**) the CopyController first checks whether the print specifications belonging to the print job have been satisfied, for example if there is a stock of the required type of image supports (format, orientation, color). If these specifications have not been met, then the job is stopped. The CopyController reports (**9-60**) this to the PrintHandler, which passes the report through to the JobServer, the latter in turn passes (**9-65**) it to the JobManager, and the latter reports (**9-70**), in the case of an interactive print job, the impossibility for printing to be carried out, to the user by a message on the display of the operator control unit **13** or, in the case of an automatic print job, alters (**9-75**) the description of the job in its administration system to an interactive print job, so that a user can consequently still start the job from the operator control panel at a later moment. Once again a print can be made (**9-80**) showing the reasons why the job has not been carried out.

If the print job can be processed, the printer unit **5** reads the image data out of the set memory **4**, prints them (**9-85**), and reports (**9-90**) this to the CopyController **6**. When the complete print job has been carried out, the CopyController reports (**92**) this to the PrintHandler **25**, which passes this to the JobServer **21**, and the latter in turn to the JobManager **12**, which then removes (**9-94**) the job from its administration system, thus completing (**9-96**) the printing process.

Scanning

FIG. **10** shows the procedure when a user wishes to have a document scanned by the apparatus in order that the digital data generated in these conditions, hereinafter referred to as the scan file, may be further used for processing or storage at his workstation. The scan file in this case is not transmitted to a predetermined address over the network immediately after generation as is usually the case, but is stored in the storage unit **20** of the apparatus, whereafter it must be called up from a workstation. The procedure with this is as follows.

Using the key **64A** on the operator control panel of the operator control unit **13** the user selects (**10-5**) the "scanner" option. In response to this the operator control unit asks (**10-5**) the JobManager **12** for a list of all the names of users known to the JobManager, i.e.: all the user names in the database of the accounting and security unit **27**. As already stated previously, these user names can be entered in the database by the apparatus manager or be automatically added by the accounting and security unit **27** on receipt of a print order from a workstation. Also, when a program intended for communication with the apparatus is started at a workstation this program can automatically be reported to the apparatus JobManager which then ensures that an entry for the user of the workstation is made in the database.

In an alternative embodiment, the user names in the database are provided with an attribute which indicates whether they are authorized to make use of the scan function. In that case the list contains only the names of the authorized users.

The JobManager passes (**10-10**) the list of the user names through to the operator control unit **13**, which displays (**10-15**) this on the display **60** for selection by the operator. This is shown in FIG. **11**, which illustrates the display **60** after selection of the scanner function.

After the user has selected his name, the operator control unit passes this through to the JobManager **12**, which by means of the accounting and security unit **27** then checks (**10-20**) whether a user code is necessary to obtain access to the scanner function. If that is the case, then by means of the operator control unit **13** it conducts a dialogue (**10-25**) with the user in order to check his code. In the case of a positive result (**10-30**), the JobManager releases the scanner function and automatically generates a name for the data file to be made during scanning, and this is passed to the operator control unit **13**, which in turn displays (**10-35**) this file name on the display **60**, so that the user subsequently knows the name by which he can find the scan file. This automatically generated name can, for example, have the form:

YYYYMMDDhhmmssxxx, which successively shows the year, month, date, hour, minute and second of the scan action, and the serial number of the document in the scanned set.

In addition, the operator control unit now displays in a form similar to the form for selection (**10-40**) of settings for a copying or printing process (cf. FIGS. **3** and **4**), a possible choice for parameters of the scan process, such as the resolution, the format (e.g. TIFF, BMP, etc.), the magnification factor, and whether the original document is to be scanned on one side or both sides. The user can select his settings from this or he can leave the preselected values as they are. The user then places his original documents in the input tray **111** of the document feeder **110** and actuates the start key **61**. In response to this the operator control unit **13** transmits a start command with all the data to the JobManager **12**.

The JobManager now reports (**10-45**) the job to the CopyController **6** and sends a start command to the JobServer **21**, which in turns starts (**10-50**) the ScanHandler **26**. The latter transmits (**10-55**) a start command to the CopyController **6**, which controls the scanner unit **3** in order to

transport the original documents one by one to the scanner, scan them, and generate scan files. In these conditions the scanner unit counts the number of original pages scanned. The scan files are stored in the set memory **4** and then transmitted **(10-60)** to the ScanHandler, which stores **(10-65)** them in the storage unit **20**. In addition, the image processing function of the set memory also makes a file with a reduced image of the scanned image, known as a "thumbnail", and this is also stored in the storage unit **20**. Thumbnails of this kind are used later for identification in the selection of a scan file.

When all the documents have been scanned, the ScanHandler **26** reports the job as finished to the JobServer, which in turn transmits **(10-70)** this to the JobManager. The latter passes the finished report **(10-75)** to the operator control unit **13**, which displays it on the display **60** of the operator control panel, together with the number of pages scanned, so that the user can check whether any documents have been skipped. That concludes the scan job.

Scanning with Scan Profile

In a specific embodiment of the apparatus according to the invention, a user can also keep for other scan jobs, settings of scan parameters hereinafter referred to jointly as the scan profile. These parameters are then stored in the storage unit **20** under the user's name in the administration system of the JobManager **12**. A scan profile can be brought up later, so that scan jobs can be programmed more quickly. This is described in FIG. **12**. The scan profile can also contain an individual name for the scan file made, this name being respected by the JobManager **12** and being used instead of the automatically generated file name, or be combined therewith. This facilitates identification of the file by a user.

FIG. **12** shows the procedure in carrying out a scan job using a scan profile. This differs only in a limited number of points from the procedure described above with reference to FIG. **10**. After the JobManager **12** by means of the accounting and security unit **27** has established the fact that a user is authorized **(12-5→12-25)** to make use of the scanner function and has generated a file name for the job that has just started, it also checks in its administration system whether scan profiles are stored under the name of this user. If so, it makes a list thereof and passes **(12-30)** it, together with the generated file name, to the operator control unit **13**, which displays **(12-35)** both on the display. Apart from a default profile, one or more profiles for general use can also be added to this list, stored in a public set in the storage unit **20**. The reproduction of scan profiles has the same form as that of files for printing in FIG. **4**. The default settings have been selected as a preference. The user can now select **(12-40, 12-45)** a profile from the displayed list. The selection should be confirmed by actuating the key beneath the selection column, whereafter the operator control unit **13** displays the settings of the selected profile on the display. Starting from the settings which are then applicable the user can then change **(12-50)** one or more thereof. If he then actuates the start key **61** (or if he actuates **(12-55)** the start key without selecting a different profile from the preselected default profile), the operator control unit **13** transmits **(12-60)** a start command with the applicable settings to the JobManager **12**, and the remainder of the procedure is as described with reference to FIG. **10**.

Making and Storing the Scan Profile

FIG. **13** shows the procedure for making and storing a scan profile from the apparatus operator control panel. The storage key **67** is used for this.

In response to actuation **(13-10)** of the storage key **67**, the operator control unit **13** asks the JobManager **12** for a list of all the user names it knows, i.e., all the user names in the database of the accounting and security unit **27**.

The JobManager passes **(13-20)** the list of user names to the operator control unit **13**, which displays **(13-30)** it on the display **60** for selection by the operator. The operator control unit **13** also asks the operator, by a message in the message window on the top left of the display **60**, whether the operator wants to make a scan or a print profile. The operator must respond to this by selecting the required function in the left-hand column above key **64A**, i.e. in this case "scanner". On this latter selection the selection screen of the chosen function is displayed on the display and the operator can make his settings. If required, he can also use the other sets of parameters, which can be called up with the keys **65A–D**.

The operator then again actuates storage key **67** and in response to this the operator control unit **13** sends the user name, function and chosen settings to the JobManager **12**, which automatically generates **(13-40)** a name for the profile, enters **(13-60)** the profile under that name in its administration system in connection with the user's name and passes the received profile together with the profile name to the JobServer **21** for storage **(13-70)** in the storage unit **20**.

The JobManager **12** then sends the generated profile name to the operator control unit **13**, which displays **(13-50)** it on the display **60**, where it subsequently disappears either by the start of a new operation or after expiry of a predetermined interval of time.

The automatically generated file name always has the extension ".pro" and if required can be replaced by a "rename" mechanism from the user's workstation by another more usable name. A standard form can be required, e.g. "sc_XXXXXX.pro", where XXXXXX has a logical text.

FIG. **14** shows the procedure in making a scan profile or changing an existing scan profile from a workstation. This requires a program specially intended to communicate with the apparatus. This program, which will hereinafter be referred to as the "WS program" has its own user identification and authorization procedure so that the JobManager **12** does not need to repeat this check.

In the WS program a user selects **(14-5)** a "scan profile editor". Within this sub-program the user can select **(14-10)** a "new" function, by means of which a new profile is prepared. On the screen at his workstation the user then has a window in which he can set **(14-15)** all the scan parameters. This can, for example, be an image identical to the image on the display **60** of the apparatus operator control unit **13**, with an image of the operator control keys, which can then be operated by means of a cursor, although some other representation can be given.

If the user has made the settings and given a name for the profile, then on his command ("save") the profile is transmitted **(14-20)** via the network to the InputHandler **15**, which stores **(14-25)** it in the storage unit **20** and reports it to the JobServer **21**. This passes information concerning the profile to the JobManager **12**, which enters **(14-30)** it in its administration system.

The user can also amend an existing scan profile, both in respect of the scan parameter settings and the name. This is possible by selecting **(14-35)** a "recall" function in the scan profile editor. The WS program then asks **(14-40)** the JobManager **12** for the scan profiles stored under the name of the relevant user, and the JobManager **12** gives **(14-45)** an overview, which is then displayed on the workstation screen for selection. After the user has selected **(14-50)** a specific scan profile, the WS program asks the JobServer **21** for the

contents of that profile, and the JobServer **21** brings it from the storage device **20** and sends **(14-55)** it via the OutputHandler **16**, whereafter it is displayed on the workstation screen. The user can now make changes **(14-60)** and use the "save" command to save them, whereupon the WS program sends **(14-65)** the new contents of the profile to the apparatus, where it is again stored **(14-70)** in the storage device **20** and reported to the JobManager **12**.

The name of a scan profile always has the extension ".pro".

Fetching a Scan File Using Workstation

FIG. **15** shows the procedure when a user wishes to fetch a scan file stored there under his name, using his workstation.

The WS program for communication with the apparatus is also required for this operation. As already stated, this program is provided with its own user identification and authorization procedure.

In the WS program, the user now selects a presentation function for all the scan files stored under his name in the storage unit **20**. The WS program then asks **(15-10)** for the list of these from the JobManager **12**, which compiles the list from its own administration system and sends **(15-15)** it back. In addition, the JobManager **12** by means of the JobServer **21** and OutputHandler **16** sends to the workstation the thumbnail belonging to each scan file. This can, for example, also be the thumbnail of the first page of a multi-page document.

The WS program now displays **(15-20)** on the workstation screen the list of scan files with the associated thumbnails for selection by the user. The user is also offered a choice for the transport mode (encrypted or not), the required format of the file, and the name under which the file is to be imported (note that the file still has an automatically generated name which contains no information as to the contents). After making the settings, the user selects the function "upload", whereupon the WS program sends a request to the JobManager **12** to forward the selected file. The JobManager passes **(15-30)** the order to the JobServer **21**, which compares **(15-40)** the required file format with the current format in which the file is stored in the storage unit **20**. If the two formats are different **(15-50)**, the JobServer **21** gives the conversion unit **28** an order to read out the file, convert it, and store it again in the storage unit **20**.

The JobServer then starts **(15-60)** the OutputHandler **16** to transmit **(15-70)** the file to the workstation. When it has completed its task, it reports **(15-80)** this to the JobServer **21**, which erases the file from the storage unit **20** and passes it on to the JobManager **12**, which in turn removes **(15-90)** the file from its administration system. Alternatively, the scan file can be kept until the user removes it actively.

Print Profile

The use of a profile having previously prepared settings can also be used for interactive printing of print files (described with reference to FIG. **8**). In that case, in the step in which the print files are displayed for selection, the profiles, now referred to as print profiles, are also displayed. Prior to selection of a print file, the user can now first select a print profile, whereafter the operator control unit **13** adapts the settings thereto. The user then selects a print file, whereupon everything progresses as already described with reference to FIG. **8**. If the user does not select a profile, then the default settings remain operative.

The making and storing of print profiles is completely similar to the making and storing of scan profiles. In this connection reference should be made to the descriptions of FIGS. **13** and **14**. A print profile will have the general name "pr_XXXXXX.pro", where XXXXXX has a logical content.

Deferred Copying

A "deferred copying" function is also supported by means of the described embodiments of scanning and printing. In this function an original document or a set of documents is scanned, whereafter the digital image data thus generated are stored in the storage unit **20** under the user's name, and can then, at a later time, be brought up for printing. This progresses as follows.

The function is started by selecting the option "deferred copying" (scan now-print later) in the column above key **64A** on the operator control panel. This is then followed by exactly the same procedure as described with reference to FIG. **10** or FIG. **12** for the scanning of documents, in which case the file of generated image data is now so administered by the JobManager that when the interactive print function is called up it is included in the list of files for selection for printing. The process is completed on completion of the scan job.

In order then to print the file, a user should select the option "printer" in the column above key **64A** on the operator control panel, in which case as already described the scan files of "deferred copying" jobs are now also displayed for selection in the column above key **64E**. The printing process is fully identical to that described with reference to FIG. **8**.

In an alternative embodiment, in the case of "deferred printing", after completion of the scanning process the scan file is not stored as an interactive print job, but is added by the JobManager **12** to the print queue for automatic print jobs (AP queue) and automatically printed when it comes to the head of the queue. This embodiment is suitable particularly for situations in which the apparatus is placed in a central reprographic department, in which jobs are processed in a continuous series.

Special Applications

A print file of the second type (IP) can be provided with an extra attribute by the WS program, so that when received in the apparatus according to the invention it is stored in the storage unit **20** under the name of a user other than the sender. In this way, a specific file can also be distributed over a group of users. The recipients, who can be warned by e-mail, then have the opportunity of having the file actually printed for their own use. If required, the recipients can also first bring up the intended print file to their workstation, in exactly the same way as described with reference to FIG. **15** in connection with scan files. After inspection of the file and the decision that it should really be printed, they then send the file, optionally as a file of the first or second type, back to the apparatus for printing there.

The possibility of receiving print files from other users can be programmed for a specific user by means of the JobManager, there being added to the entry of that user in the database of the accounting and security unit **27** a data item which either authorizes the receipt of such files or not. This data item can if required be so extended that it authorizes only the receipt of files from specific other users referred to in the data item, and hence obstructs those of other users.

The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

What is claimed is:

1. A digital image reproduction apparatus comprising:

a scanner unit,

a printer unit,

a memory,

an operator control unit integrated in the apparatus and provided with an input device and a display for a user to give operator control commands to the apparatus,

a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users,

a management unit connected to the said scanner unit, said printer unit, said memory and said network connection unit, and, via the network connection unit, to the workstations,

said management unit maintaining logic storage spaces in said memory, each allocated to a respective user,

wherein said management unit, when receiving from one of the user's workstations a digital data file for printing, stores the digital data file in the logic storage space of the relevant user and passes it for printing to said printer unit only on an operator control command from said operator control unit, which operator control command identifies the relevant file,

wherein, on receipt from the operator control unit of an operator control command for scanning, the command being provided with a user identification, said management unit stores the digital data generated by said scanner unit in executing the command in the logic storage space of the relevant user and passes the digital data generated by said scanner unit to the workstation of the relevant user only on a command from the workstation of the relevant user that identifies the relevant file,

wherein said management unit, on receiving from the workstation a digital data file for printing, such file being provided with a user identification, checks whether said management unit is already managing a logic storage space for the relevant user, and if that is not the case, adds a logic storage space for the relevant user and stores therein the received digital data file.

2. A digital image reproduction apparatus comprising:

a scanner unit,

a printer unit,

a memory,

an operator control unit integrated in the apparatus and provided with an input device and a display for a user to give operator control commands to the apparatus,

a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users,

a management unit connected to the said scanner unit, said printer unit, said memory and said network connection unit, and, via the network connection unit, to the workstations,

said management unit maintaining logic storage spaces in said memory, each allocated to a respective user,

wherein said management unit, when receiving from one of the user's workstations a digital data file for printing, stores the digital data file in the logic storage space of the relevant user and passes it for printing to said printer unit only on an operator control command from said operator control unit, which operator control command identifies the relevant file,

wherein, on receipt from the operator control unit of an operator control command for scanning, the command being provided with a user identification, said management unit stores the digital data generated by said scanner unit in executing the command in the logic storage space of the relevant user and passes the digital data generated by said scanner unit to the workstation of the relevant user only on a command from the workstation of the relevant user that identifies the relevant file,

wherein the user's workstation is provided with a program for communicating with the apparatus,

the program communicating, upon startup thereof, to said management unit giving an identification of the user, and

said management unit, on receiving the communication, checks whether said management unit is already managing a logic storage space for the relevant user and, if that is not the case, adds a logic storage space for the relevant user.

3. The apparatus according to claim 1, said operator control unit including:

means for a user to set print parameters in accordance with which a print order must be executed by said printer unit, and

means for passing print parameters set by a user, in combination with an identification of the relevant user, to said management unit; and

said management unit including:

means for receiving from the workstation print parameters, also in combination with an identification of the user, and

means for storing the passed and received print parameters in the logic storage space of the relevant user.

4. The apparatus according to claim 3,

wherein, on a command from the operator control unit, such command specifying a user and a group of print parameters stored in the memory,

said management unit reads the group of print parameters out of the logic storage space of the relevant user and transmits to said printer unit for printing a digital data file in accordance therewith.

5. The apparatus according to claim 1, said operator control unit including:

means for a user to set scan parameters in accordance with which a scan order is to be executed by the scanner unit, and

means for transmitting scan parameters set by a user, in combination with an identification of the relevant user, to said management unit; and

said management unit including:

means for receiving scan parameters, also in combination with an identification of a user, from the workstation, and

means for storing the passed and received scan parameters in the logic storage space of the relevant user.

6. The apparatus according to claim 5,

wherein on a command from the operator control unit, such command specifying a user and a group of scan parameters stored in said memory,

said management unit reads out the group of scan parameters from the logic storage space of the relevant user and transmits to said scanner unit for scanning a

document in accordance therewith and in so doing generating a digital data file.

7. A digital image reproduction apparatus comprising:

a scanner unit,

a printer unit,

a memory,

an operator control unit integrated in the apparatus and provided with an input device and a display for a user to give operator control commands to the apparatus,

a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users,

a management unit connected to the said scanner unit, said printer unit, said memory and said network connection unit, and, via the network connection unit, to the workstations,

said management unit maintaining logic storage spaces in said memory, each allocated to a respective user,

wherein said management unit, when receiving from one of the user's workstations a digital data file for printing, stores the digital data file in the logic storage space of the relevant user and passes it for printing to said printer unit only on an operator control command from said operator control unit, which operator control command identifies the relevant file,

wherein, on receipt from the operator control unit of an operator control command for scanning, the command being provided with a user identification, said management unit stores the digital data generated by said scanner unit in executing the command in the logic storage space of the relevant user and passes the digital data generated by said scanner unit to the workstation of the relevant user only on a command from the workstation of the relevant user that identifies the relevant file,

wherein said management unit on receiving from said operator control unit a deferred copying order provided with an identification of a user, stores the digital data generated by said scanner unit in executing the order in the logic storage space of the relevant user and passes it for printing to said printer unit only on a command from said operator control unit, which command identifies the relevant file.

8. The apparatus according to claim 1,

wherein said management unit manages a directory structure in said memory, the logic storage spaces being formed by directories in the directory structure.

9. The apparatus according to claim 1,

wherein said management unit manages a database in said memory, the logic storage spaces being formed by entries in the database.

10. A digital image reproduction apparatus comprising:

a scanner unit,

a printer unit,

a memory,

an operator control unit integrated in the apparatus and provided with an input device and a display for a user to give operator control commands to the apparatus,

a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users,

a management unit connected to the said scanner unit, said printer unit, said memory and said network connection unit, and, via the network connection unit, to the workstations,

said management unit maintaining logic storage spaces in said memory, each allocated to a respective user,

wherein said management unit, when receiving from one of the user's workstations a digital data file for printing, stores the digital data file in the logic storage space of the relevant user and passes it for printing to said printer unit only on an operator control command from said operator control unit, which operator control command identifies the relevant file,

wherein, on receipt from the operator control unit of an operator control command for scanning, the command being provided with a user identification, said management unit stores the digital data generated by said scanner unit in executing the command in the logic storage space of the relevant user and passes the digital data generated by said scanner unit to the workstation of the relevant user only on a command from the workstation of the relevant user that identifies the relevant file,

wherein said management unit on a command for this purpose from said operator control unit,

generates a list of users for whom it manages a logic storage space in said memory, and

transmits the list to said operator control unit which in turn displays at least a part of the list on the display for selection by a user,

whereafter said operator control unit interprets a selection made by the user as being an identification of the user.

11. A method of reproducing digital images in a digital image reproduction apparatus having a scanner unit, a printer unit, a memory, an operator control unit integrated in the apparatus and provided with an input device and a display for a user to give operator control commands to the apparatus, a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users; the method comprising:

maintaining logic storage spaces in the memory, each allocated to a respective user,

storing, upon receipt from one of the user's workstations a digital data file for printing, the digital data file in the logic storage space of the relevant user, and passing the digital data file to the printer unit only on an operator control command from the operator control unit, which operator control command identifies the relevant file,

storing, upon receipt from the operator control unit of an operator control command for scanning, the command being provided with a user identification, the digital data generated by the scanner unit in executing the command in the logic storage space of the relevant user and passing the digital data generated by the scanner unit to the workstation of the relevant user only on a command from the workstation of the relevant user that identifies the relevant file, and

checking, upon receipt from the workstation a digital data file for printing, such file being provided with a user identification, whether a logic storage space for the relevant user is already being managed, and if that is not the case, adding a logic storage space for the relevant user and storing therein the received digital data file.

12. The method according to claim 11, further comprising:

permitting a user, via the operator control unit, to set print parameters in accordance with which a print order must be executed by said printer unit,

passing print parameters set by a user, in combination with an identification of the relevant user, from the workstation to the apparatus,

receiving from the workstation print parameters, also in combination with an identification of the user, and

storing the passed and received print parameters in the logic storage space of the relevant user.

13. The method according to claim 11, further comprising:

permitting a user, via the operator control unit, to set print parameters in accordance with which a scan order must be executed by the scanner unit,

transmitting scan parameters set by a user, in combination with an identification of the relevant user, from the workstation to the apparatus,

receiving the scan parameters, also in combination with an identification of a user, from the workstation, and

storing the transmitted and received scan parameters in the logic storage space of the relevant user.

14. The method according to claim 11, further comprising:

managing a directory structure in the memory, the logic storage spaces being formed by directories in the directory structure.

15. The method according to claim 11, further comprising:

managing a database in the memory, the logic storage spaces being formed by entries in the database.

16. A method of reproducing digital images in a digital image reproduction apparatus having a scanner unit, a printer unit, a memory, an operator control unit integrated in the apparatus and provided with an input device and a display for a user to give operator control commands to the apparatus, a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users; the method comprising:

maintaining logic storage spaces in the memory, each allocated to a respective user,

storing, upon receipt from one of the user's workstations a digital data file for printing, the digital data file in the logic storage space of the relevant user, and passing the digital data file to the printer unit only on an operator control command from the operator control unit, which operator control command identifies the relevant file,

storing, upon receipt from the operator control unit of an operator control command for scanning, the command being provided with a user identification, the digital data generated by the scanner unit in executing the command in the logic storage space of the relevant user and passing the digital data generated by the scanner unit to the workstation of the relevant user only on a command from the workstation of the relevant user that identifies the relevant file,

providing a program in the workstation for communicating with the apparatus,

the program communicating, upon startup thereof, to the apparatus giving an identification of the user, and

checking, upon receipt of the communication, whether a logic storage space is already being managed for the relevant user and, if that is not the case, adding a logic storage space for the relevant user.

17. The method according to claim 12,

including, on a command from the operator control unit, such command specifying a user and a group of print parameters stored in the memory,

reading the group of print parameters out of the logic storage space of the relevant user and transmitting to the printer unit for printing a digital data file in accordance therewith.

18. The method according to claim 13,

including on a command from the operator control unit, such command specifying a user and a group of scan parameters stored in the memory,

reading out the group of scan parameters from the logic storage space of the relevant user and transmitting to the scanner unit for scanning a document in accordance therewith and in so doing generating a digital data file.

19. A method of reproducing digital images in a digital image reproduction apparatus having a scanner unit, a printer unit, a memory, an operator control unit integrated in the apparatus and provided with an input device and a display for a user to give operator control commands to the apparatus, a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users; the method comprising:

maintaining logic storage spaces in the memory, each allocated to a respective user,

storing, upon receipt from one of the user's workstations a digital data file for printing, the digital data file in the logic storage space of the relevant user, and passing the digital data file to the printer unit only on an operator control command from the operator control unit, which operator control command identifies the relevant file,

storing, upon receipt from the operator control unit of an operator control command for scanning, the command being provided with a user identification, the digital data generated by the scanner unit in executing the command in the logic storage space of the relevant user and passing the digital data generated by the scanner unit to the workstation of the relevant user only on a command from the workstation of the relevant user that identifies the relevant file,

including upon receipt from the operator control unit a deferred copying order provided with an identification of a user,

storing the digital data generated by the scanner unit in executing the order in the logic storage space of the relevant user and passing it for printing to the printer unit only on a command from the operator control unit, which command identifies the relevant file.

20. A method of reproducing digital images in a digital image reproduction apparatus having a scanner unit, a printer unit, a memory, an operator control unit integrated in the apparatus and provided with an input device and a display for a user to give operator control commands to the apparatus, a network connection unit for coupling to a network for the purpose of communication with a digital external environment having at least a number of workstations of users; the method comprising:

maintaining logic storage spaces in the memory, each allocated to a respective user,

storing, upon receipt from one of the user's workstations a digital data file for printing, the digital data file in the logic storage space of the relevant user, and passing the digital data file to the printer unit only on an operator

control command from the operator control unit, which operator control command identifies the relevant file,

storing, upon receipt from the operator control unit of an operator control command for scanning, the command being provided with a user identification, the digital data generated by the scanner unit in executing the command in the logic storage space of the relevant user and passing the digital data generated by the scanner unit to the workstation of the relevant user only on a command from the workstation of the relevant user that identifies the relevant file,

generating a list of users for in which a logic storage space is managed in the memory upon a command for this purpose from the operator control unit, and

transmitting the list to the operator control unit which in turn displays at least a part of the list on the display for selection by a user,

whereafter the operator control unit interprets a selection made by the user as being an identification of the user.

* * * * *

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United States Patent [19]

Bleizeffer et al.

[11] **Patent Number: 6,115,720**

[45] **Date of Patent: Sep. 5, 2000**

[54] **METHOD AND APPARATUS FOR PERFORMING A HEALTH CHECK ON A DATABASE SYSTEM**

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[73] Assignee: **International Business Machines Corportion**, Armonk, N.Y.

[21] Appl. No.: **09/058,138**

[22] Filed: **Apr. 10, 1998**

Related U.S. Application Data

[60] Provisional application No. 60/069,628, Dec. 15, 1997.

[51] **Int. Cl.**[7] **G06F 17/30**

[52] **U.S. Cl.** **707/201**; 707/10; 707/200; 707/201; 707/203; 707/511; 711/100; 717/5; 345/349

[58] **Field of Search** 707/1, 3, 4, 5, 707/500, 513, 202, 203, 511, 8, 10, 200, 201, 205; 717/1, 5, 7; 711/2, 100; 345/349; 709/203, 220, 225–226

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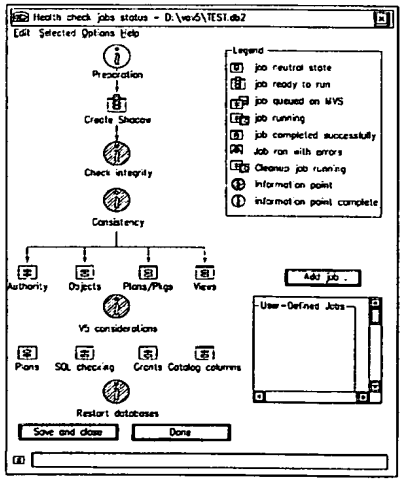
Assistant Examiner—Shahid Alam
Attorney, Agent, or Firm—Sughrue, Mion, Zinn, Macpeak & Seas, PLLC

[57] **ABSTRACT**

A method and apparatus for compensating for deficiencies existing in programs to assist a user through installing a program. Polling the status of jobs requested by the user of a workstation is done so that the user may eventually be provided with status reports regarding the jobs being executed. The user can set parameters during loading of SMPE libraries, install, migrate, fallback, remigrate and update procedures for the program. An indication is provided to a user of a workstation as steps of a task have been completed by the user. The health of catalog and directory databases may be verified before a migrate procedure is performed. The user of the program can be informed regarding parameters whose default values have changed, which parameters are of particular concern to the specific user.

20 Claims, 21 Drawing Sheets



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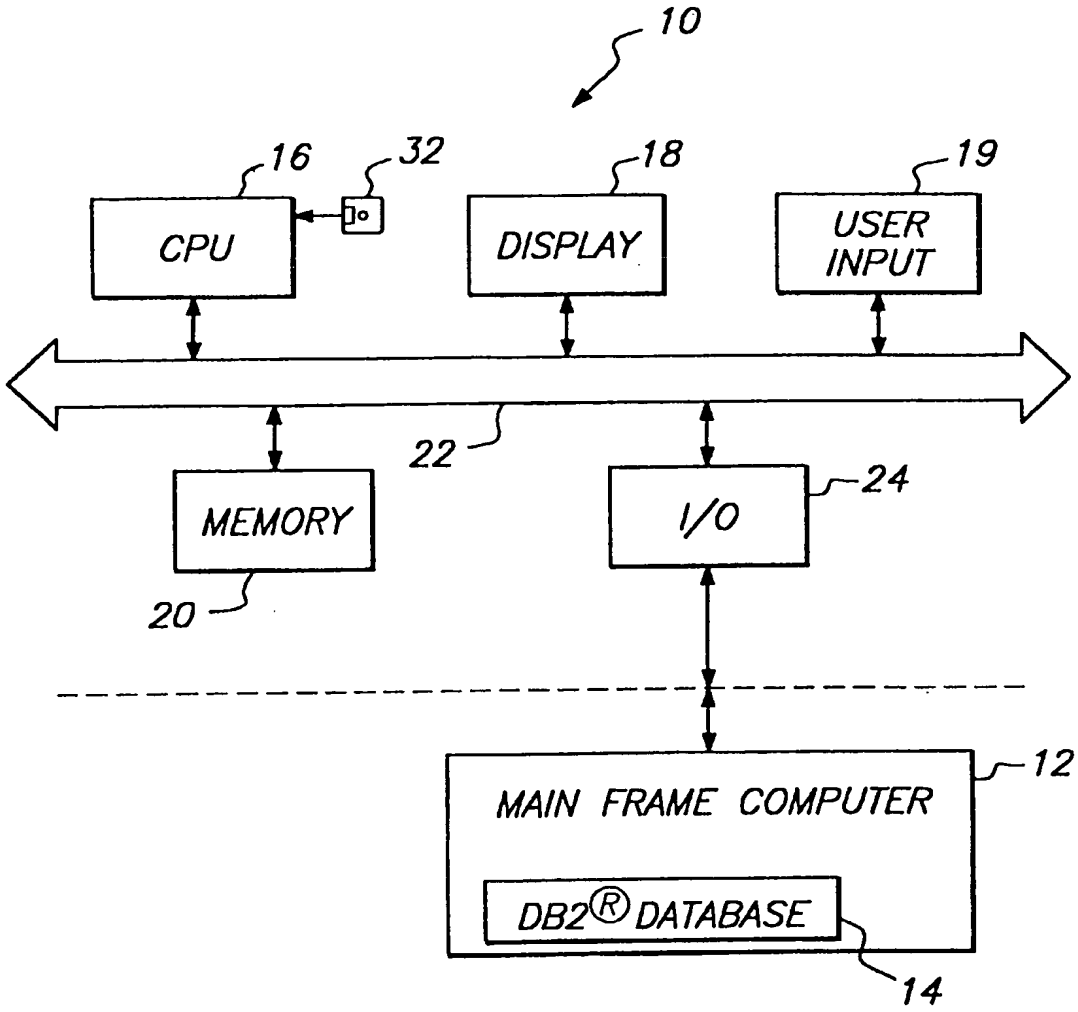

10
16
32
18
19
CPU
DISPLAY
USER INPUT
22
MEMORY
I/O
24
20
MAIN FRAME COMPUTER
12
DB2® DATABASE
14

FIG. 1

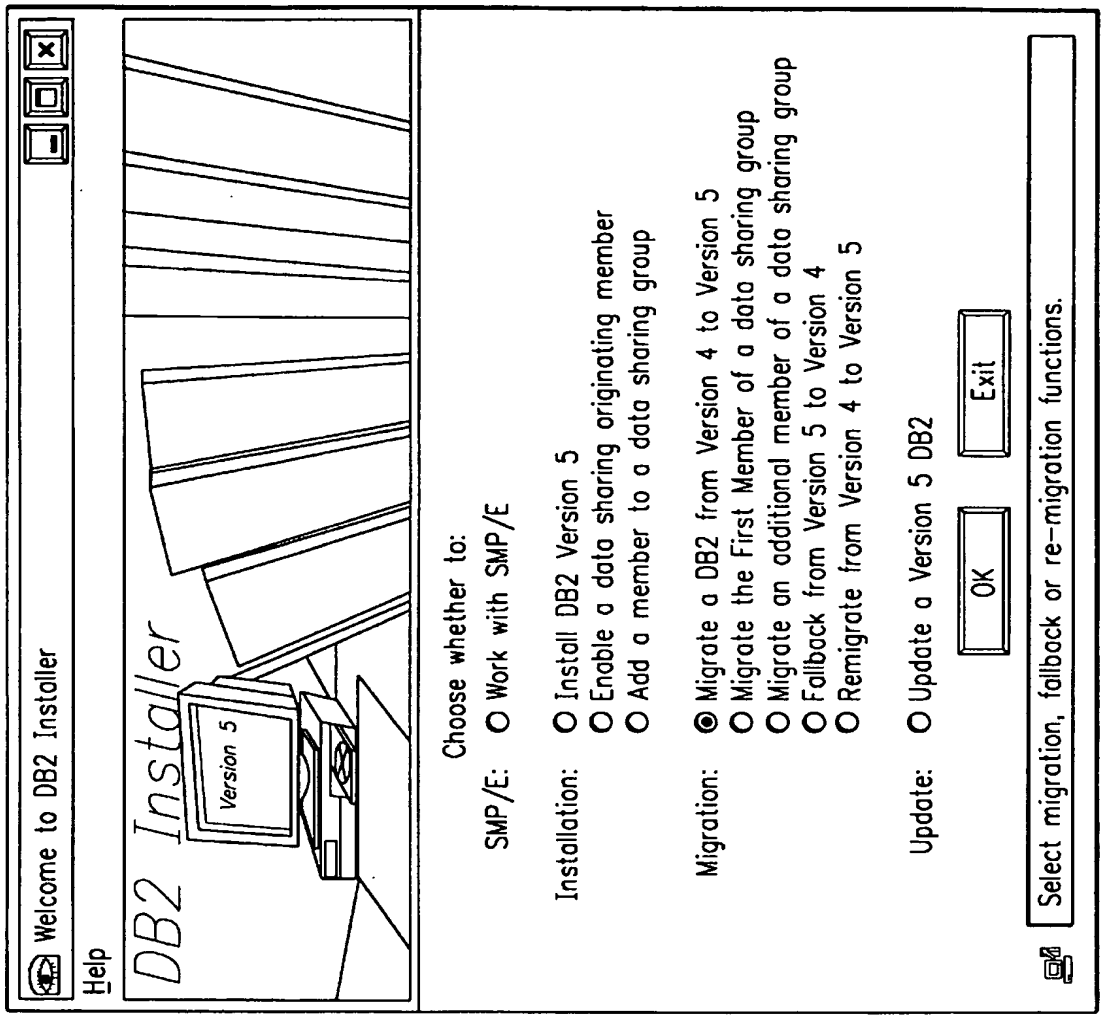

Welcome to DB2 Installer
Help
DB2 Installer
Version 5
Choose whether to:
SMP/E:
O Work with SMP/E
Installation:
O Install DB2 Version 5
O Enable a data sharing originating member
O Add a member to a data sharing group
Migration:
O Migrate a DB2 from Version 4 to Version 5
O Migrate the First Member of a data sharing group
O Migrate an additional member of a data sharing group
O Fallback from Version 5 to Version 4
O Remigrate from Version 4 to Version 5
Update:
O Update a Version 5 DB2
OK
Exit
Select migration, fallback or re-migration functions.

FIG. 2

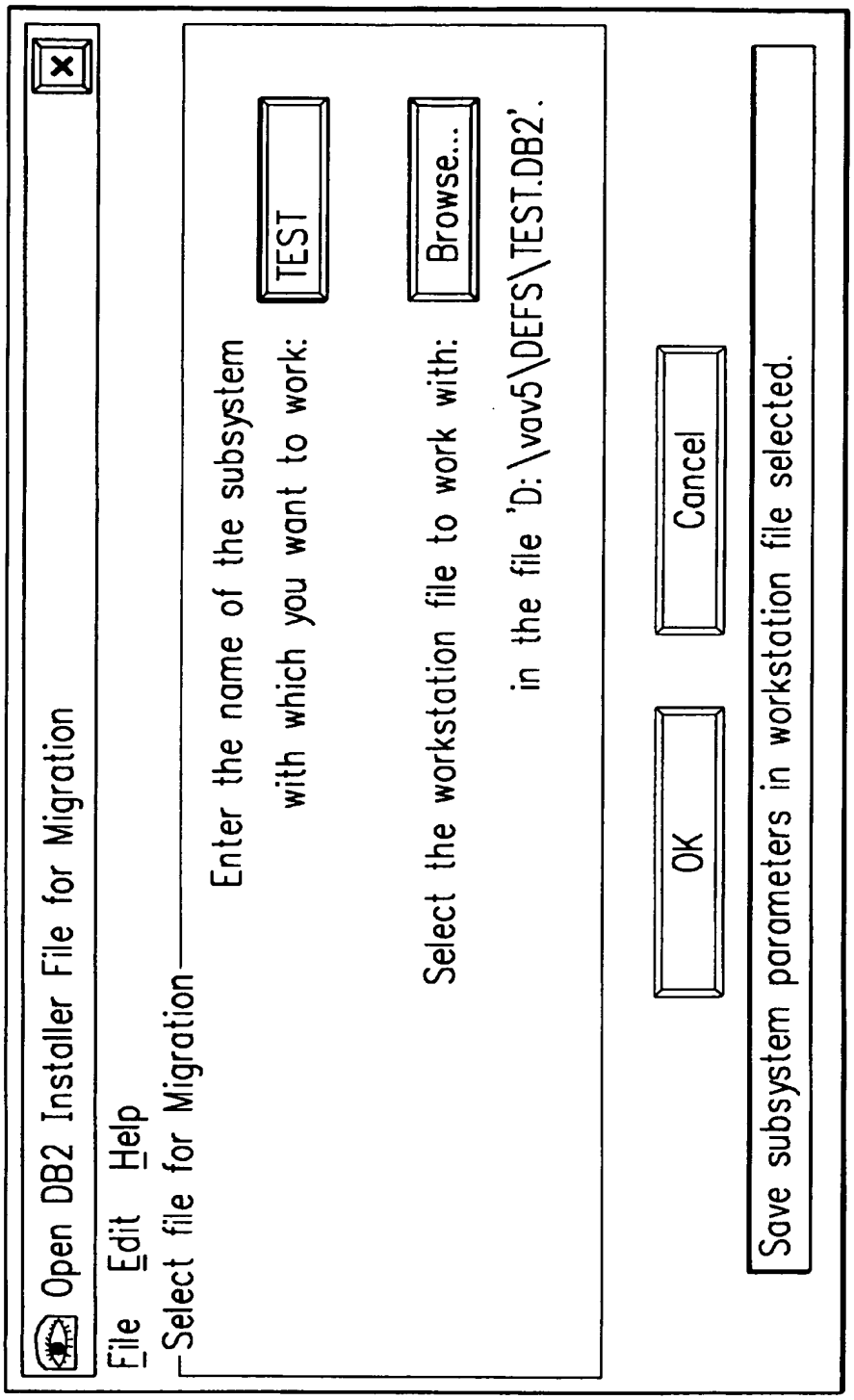

Open DB2 Installer File for Migration
File Edit Help
Select file for Migration
Enter the name of the subsystem
with which you want to work:
TEST
Select the workstation file to work with:
Browse...
in the file 'D:\vav5\DEFS\TEST.DB2'.
OK
Cancel
Save subsystem parameters in workstation file selected.

FIG. 3

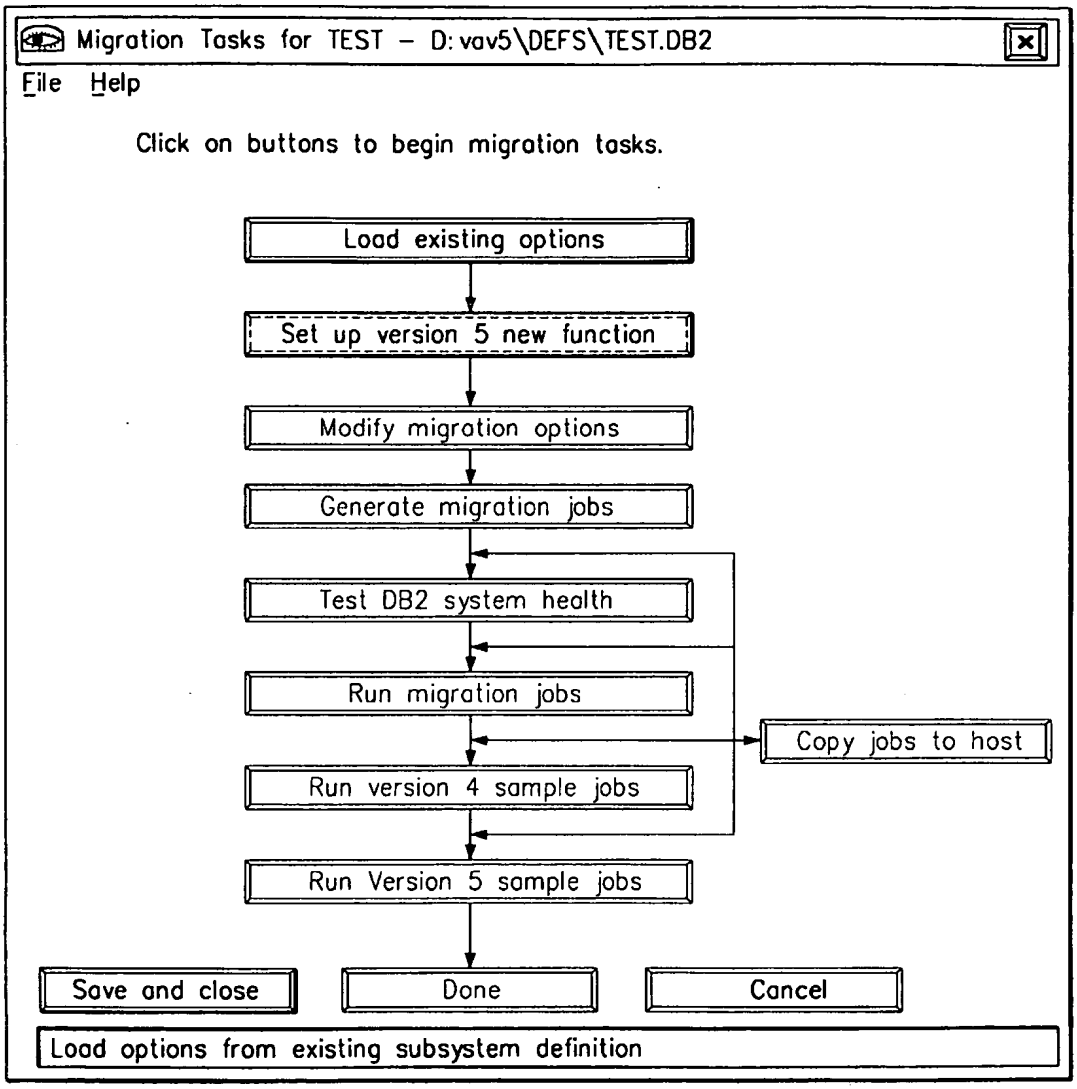

Migration Tasks for TEST – D:\vav5\DEFS\TEST.DB2
File Help
Click on buttons to begin migration tasks.
Load existing options
Set up version 5 new function
Modify migration options
Generate migration jobs
Test DB2 system health
Run migration jobs
Copy jobs to host
Run version 4 sample jobs
Run Version 5 sample jobs
Save and close
Done
Cancel
Load options from existing subsystem definition

FIG. 4

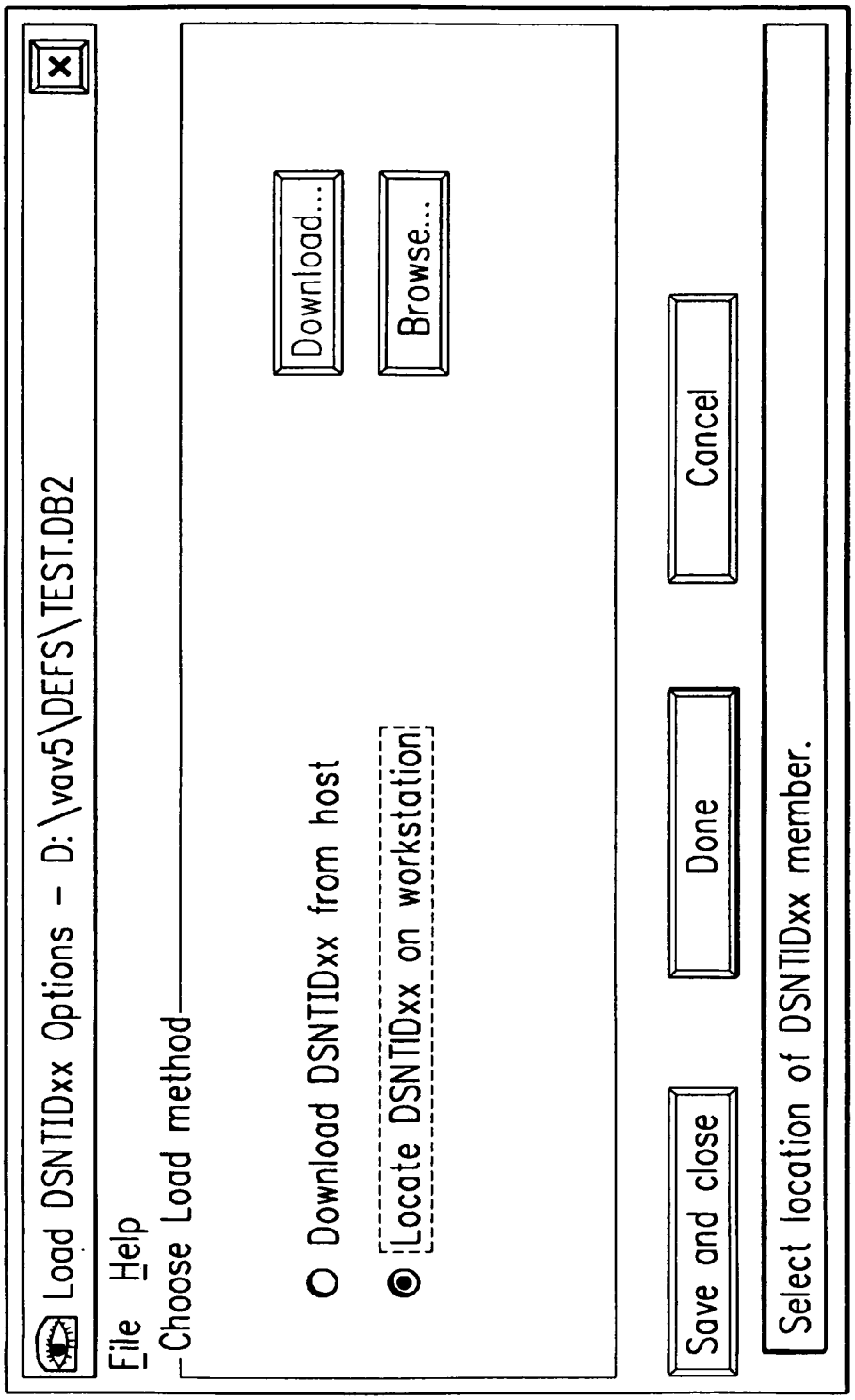

Load DSNTIDxx Options - D: \vav5\DEFS\TEST.DB2
File Help
Choose Load method
Download DSNTIDxx from host
Locate DSNTIDxx on workstation
Download...
Browse...
Save and close
Done
Cancel
Select location of DSNTIDxx member.

FIG. 5

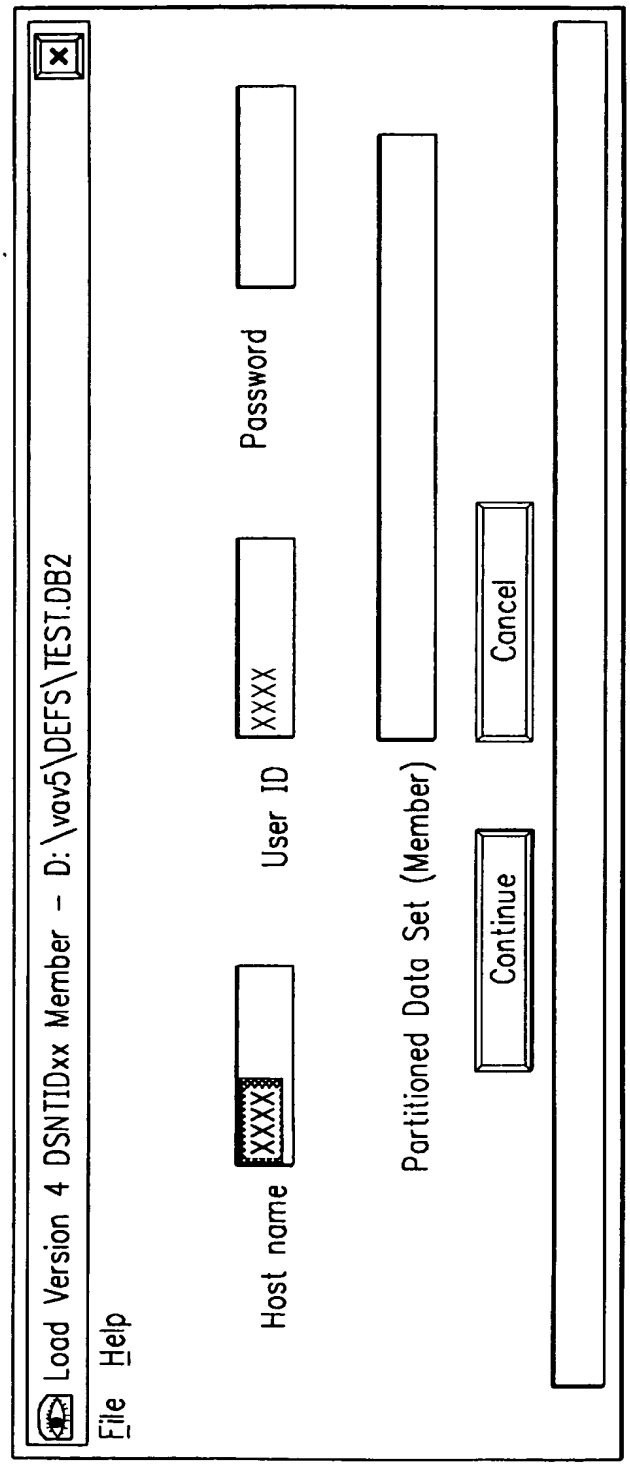

Load Version 4 DSNTIDxx Member - D:\vav5\DEFS\TEST.DB2
File Help
Host name
XXXX
User ID
XXXX
Password
Partitioned Data Set (Member)
Continue
Cancel

FIG. 6

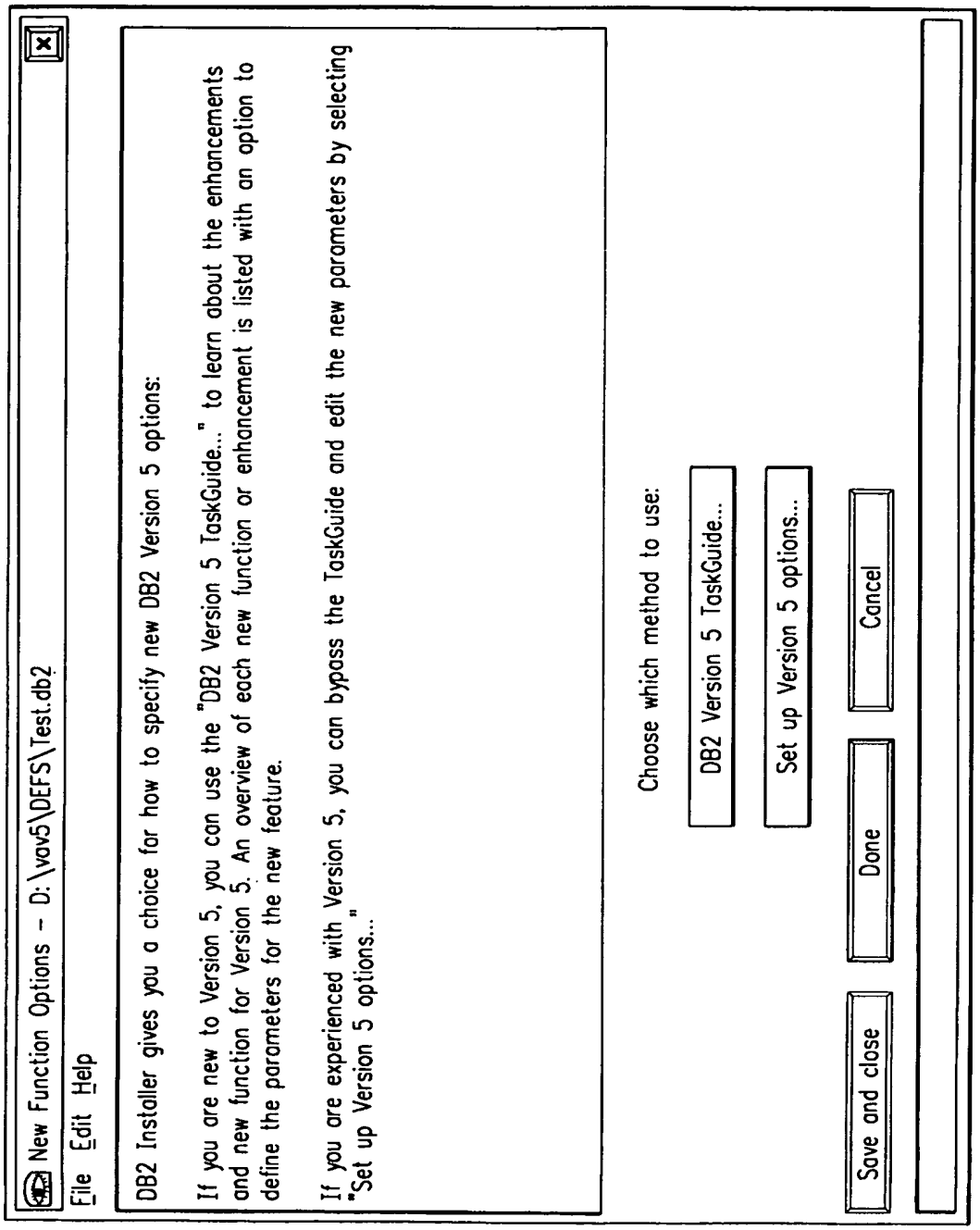
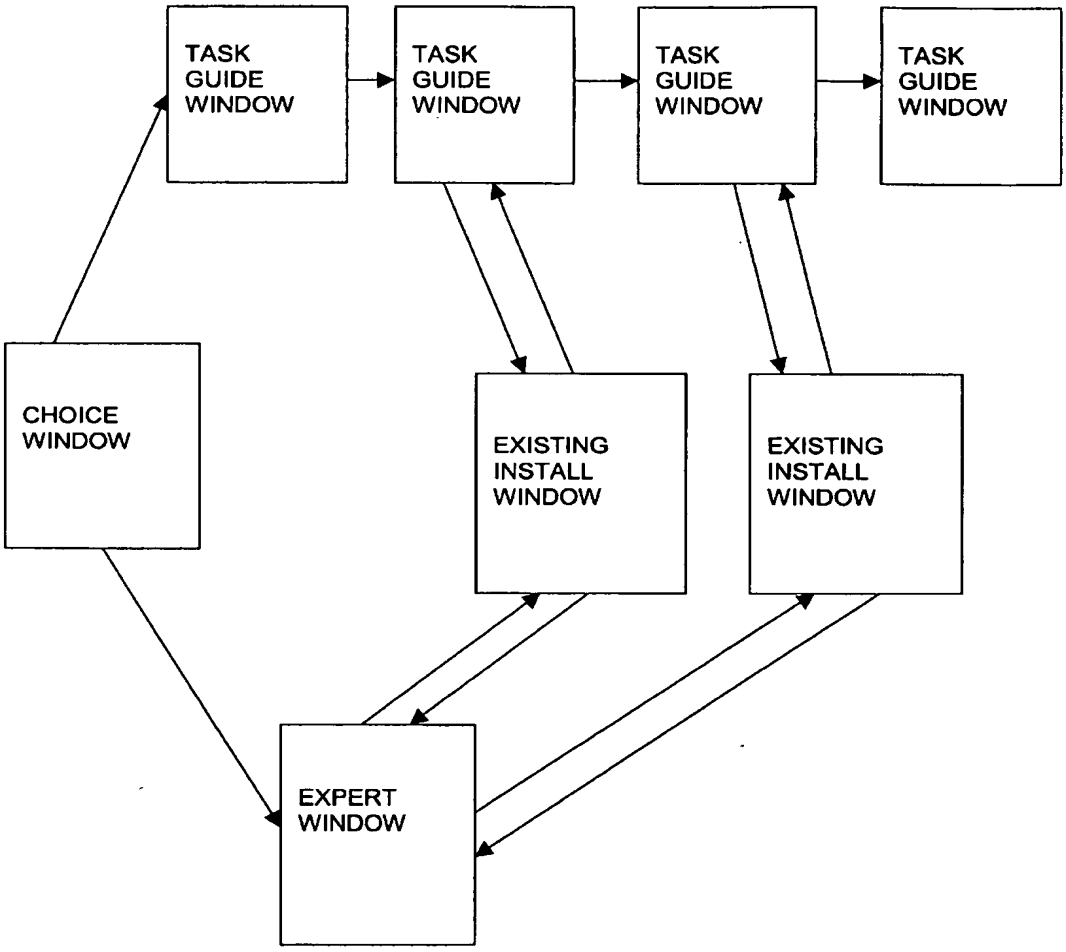

New Function Options - D:\vav5\DEFS\Test.db2
File Edit Help
DB2 Installer gives you a choice for how to specify new DB2 Version 5 options:
If you are new to Version 5, you can use the "DB2 Version 5 TaskGuide..." to learn about the enhancements and new function for Version 5. An overview of each new function or enhancement is listed with an option to define the parameters for the new feature.
If you are experienced with Version 5, you can bypass the TaskGuide and edit the new parameters by selecting "Set up Version 5 options..."
Choose which method to use:
DB2 Version 5 TaskGuide...
Set up Version 5 options...
Save and close
Done
Cancel

FIG. 7

FIG. 8


TASK GUIDE WINDOW
TASK GUIDE WINDOW
TASK GUIDE WINDOW
TASK GUIDE WINDOW
CHOICE WINDOW
EXISTING INSTALL WINDOW
EXISTING INSTALL WINDOW
EXPERT WINDOW

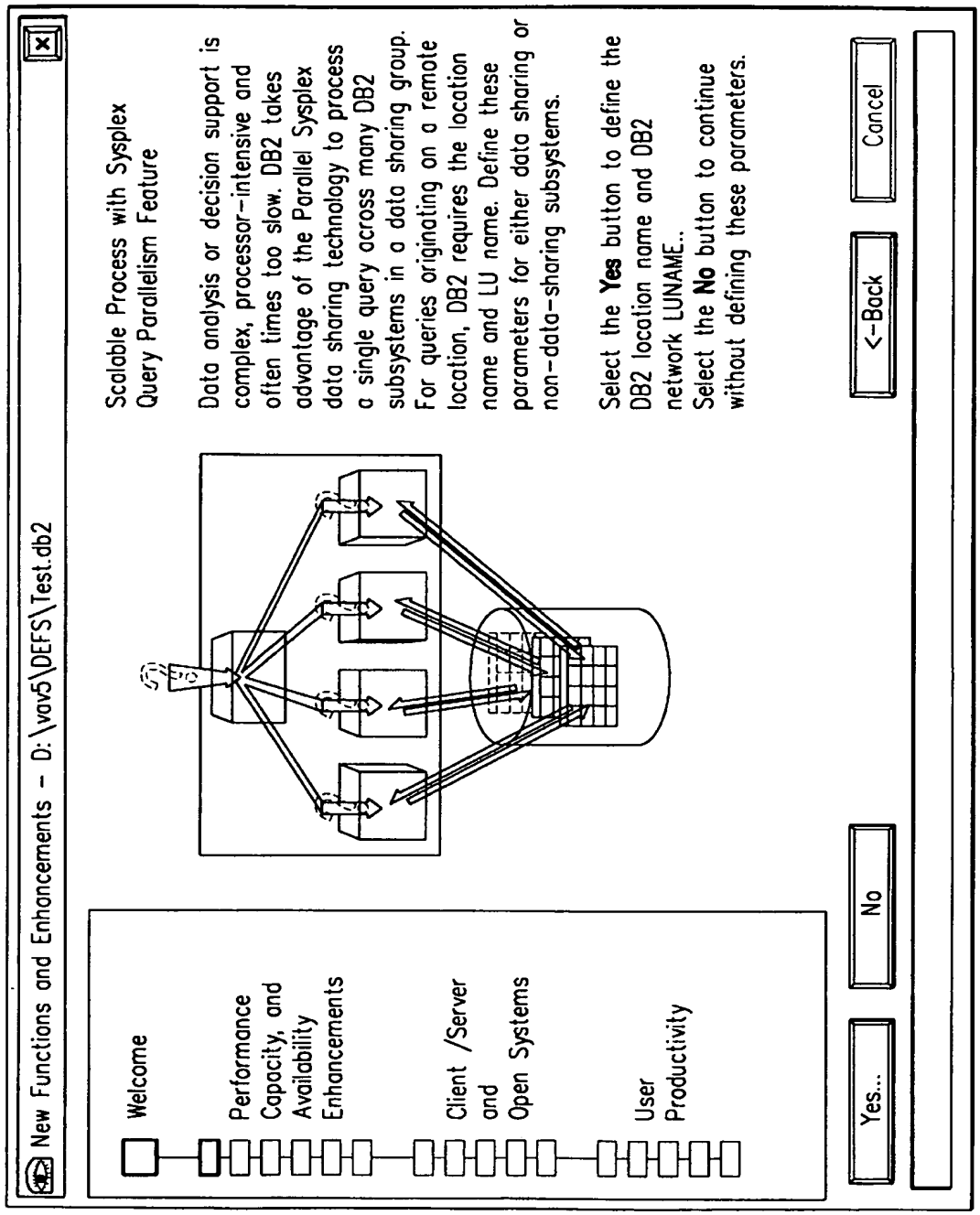

New Functions and Enhancements - D:\vav5\DEFS\Test.db2
Welcome
Performance Capacity, and Availability Enhancements
Client /Server and Open Systems
User Productivity
Scalable Process with Sysplex Query Parallelism Feature
Data analysis or decision support is complex, processor-intensive and often times too slow. DB2 takes advantage of the Parallel Sysplex data sharing technology to process a single query across many DB2 subsystems in a data sharing group. For queries originating on a remote location, DB2 requires the location name and LU name. Define these parameters for either data sharing or non-data-sharing subsystems.
Select the Yes button to define the DB2 location name and DB2 network LUNAME..
Select the No button to continue without defining these parameters.
Yes...
No
<-Back
Cancel

FIG. 9

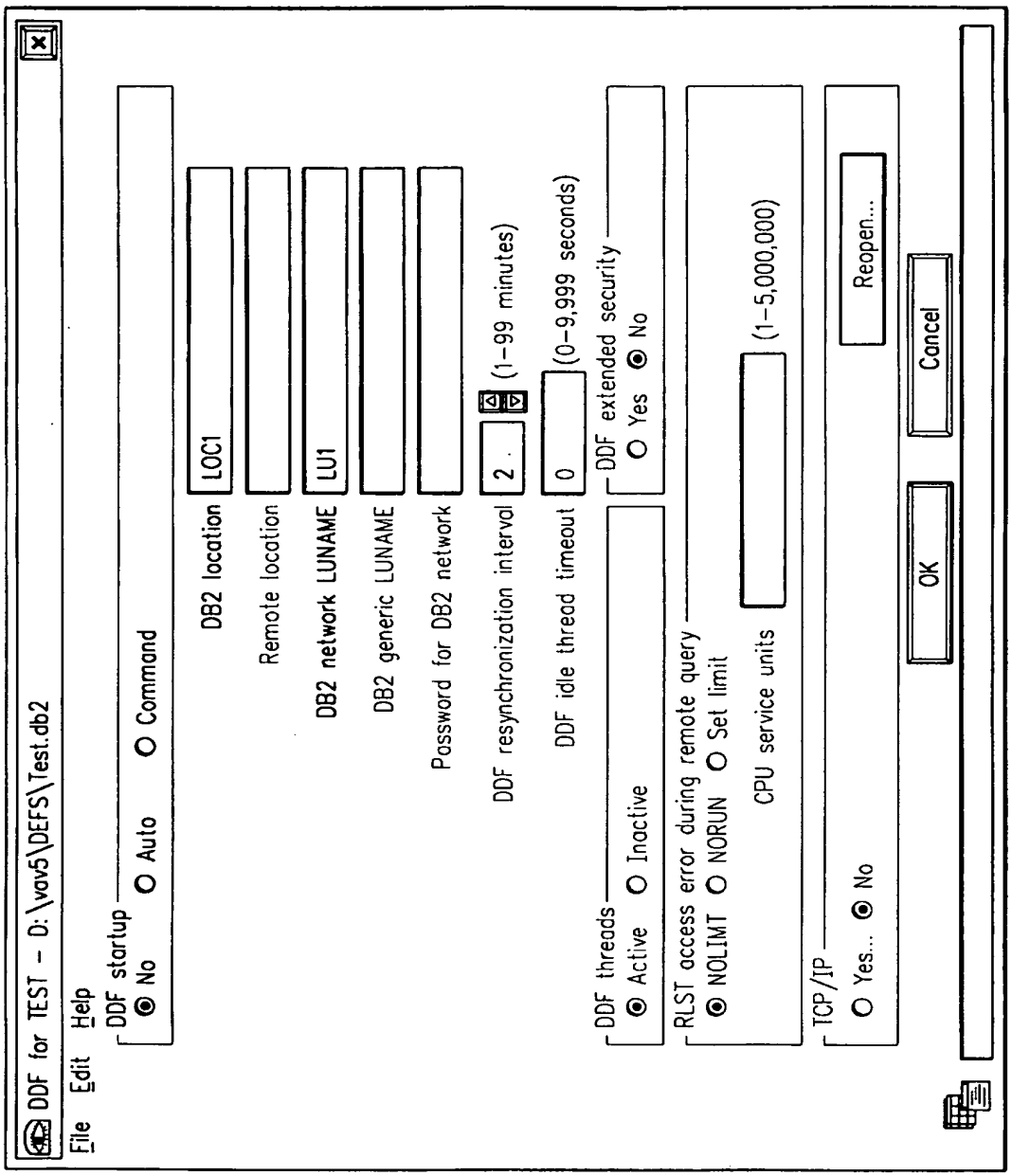

DDF for TEST - D:\wav5\DEFS\Test.db2
File Edit Help
DDF startup
No
Auto
Command
DB2 location
LOC1
Remote location
DB2 network LUNAME
LU1
DB2 generic LUNAME
Password for DB2 network
DDF resynchronization interval
2
(1-99 minutes)
DDF idle thread timeout
0
(0-9,999 seconds)
DDF threads
Active
Inactive
DDF extended security
Yes
No
RLST access error during remote query
NOLIMT
NORUN
Set limit
CPU service units
(1-5,000,000)
TCP/IP
Yes...
No
Reopen...
OK
Cancel

FIG. 10

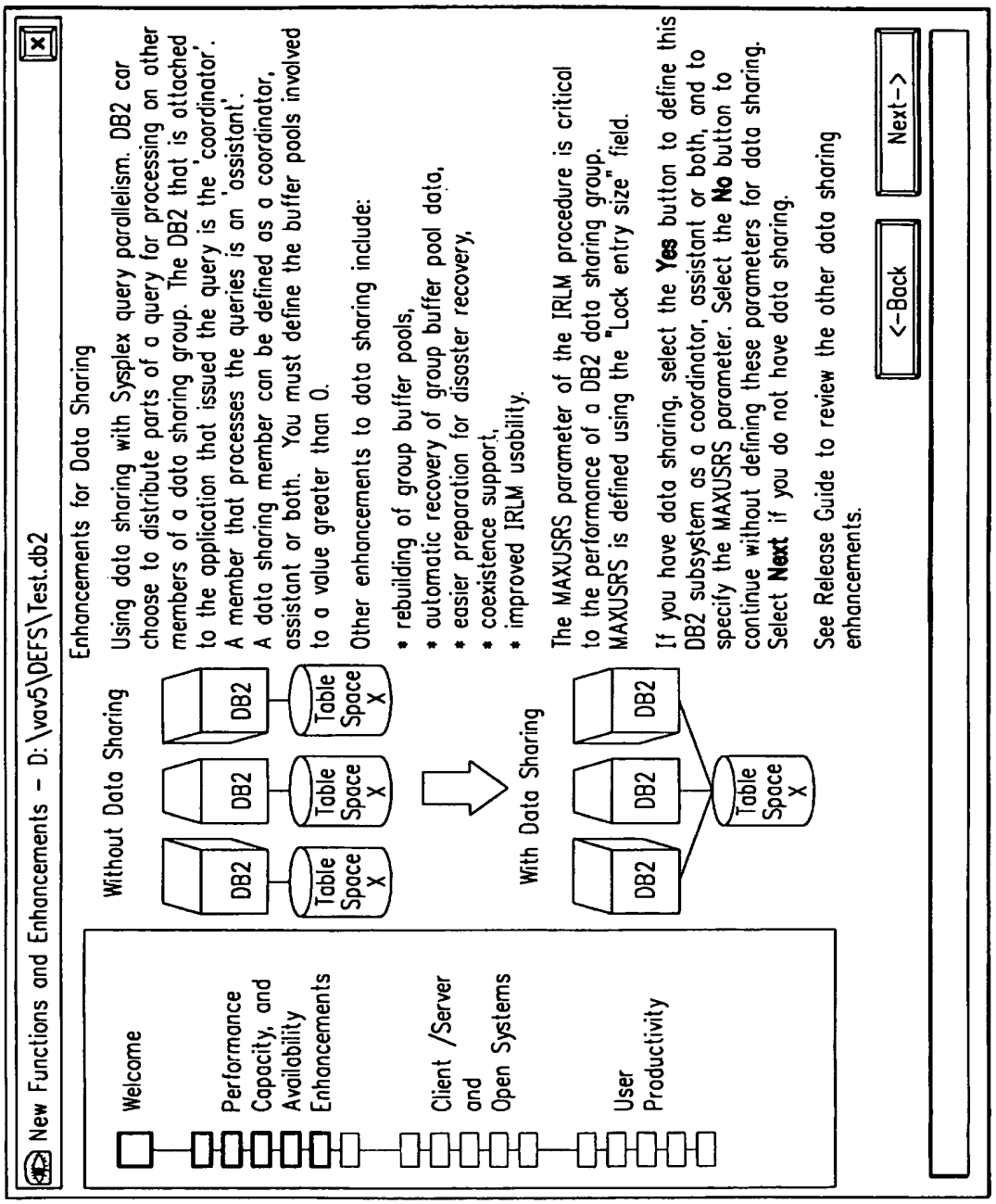

New Functions and Enhancements - D:\wav5\DEFS\Test.db2
Welcome
Performance Capacity, and Availability Enhancements
Client /Server and Open Systems
User Productivity
Enhancements for Data Sharing
Without Data Sharing
DB2
Table Space X
With Data Sharing
Using data sharing with Sysplex query parallelism. DB2 can choose to distribute parts of a query for processing on other members of a data sharing group. The DB2 that is attached to the application that issued the query is the 'coordinator'. A member that processes the queries is an 'assistant'. A data sharing member can be defined as a coordinator, assistant or both. You must define the buffer pools involved to a value greater than 0.
Other enhancements to data sharing include:
* rebuilding of group buffer pools,
* automatic recovery of group buffer pool data,
* easier preparation for disaster recovery,
* coexistence support,
* improved IRLM usability.
The MAXUSRS parameter of the IRLM procedure is critical to the performance of a DB2 data sharing group. MAXUSRS is defined using the "Lock entry size" field.
If you have data sharing, select the Yes button to define this DB2 subsystem as a coordinator, assistant or both, and to specify the MAXUSRS parameter. Select the No button to continue without defining these parameters for data sharing. Select Next if you do not have data sharing.
See Release Guide to review the other data sharing enhancements.
<-Back
Next->

FIG. 11

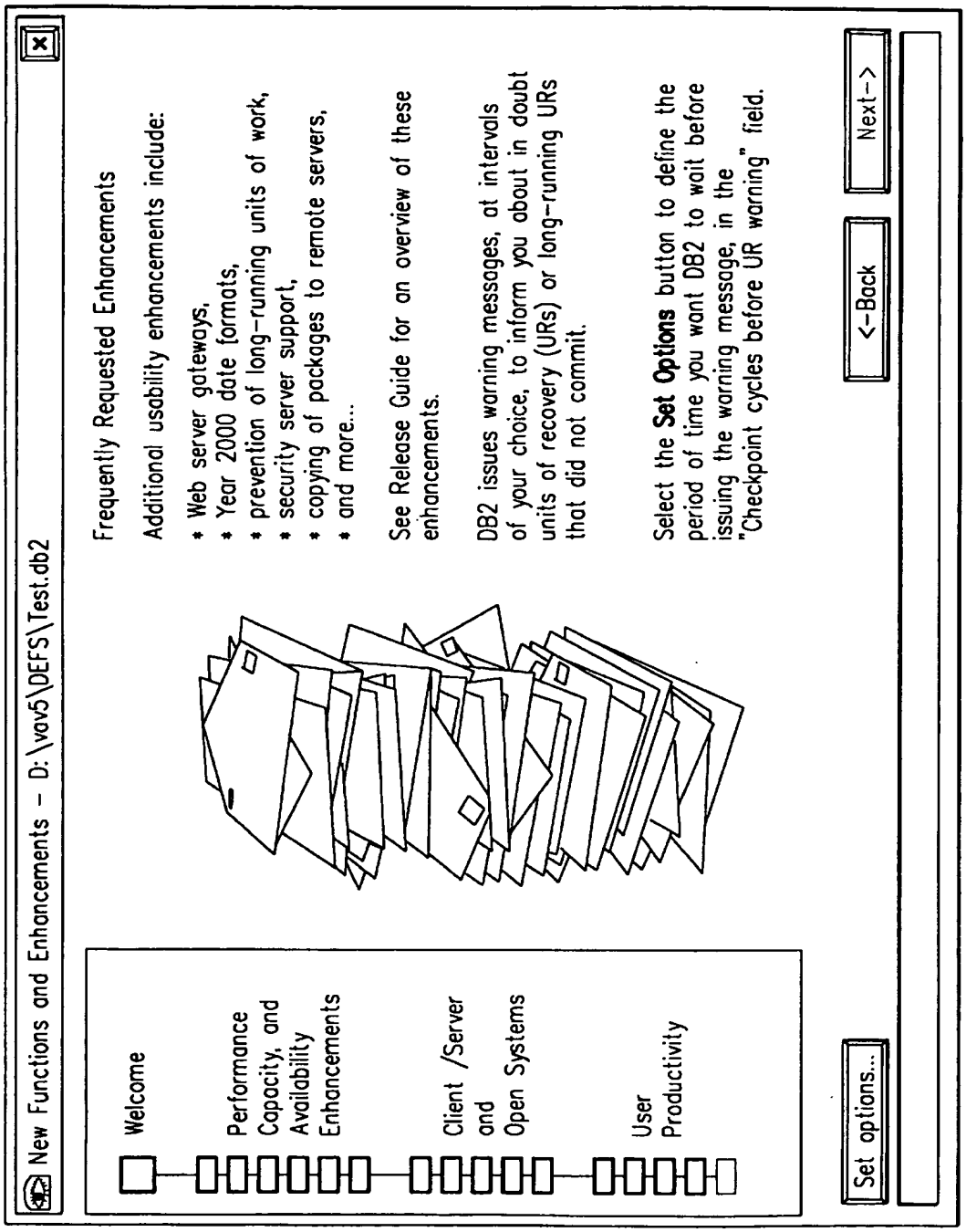

New Functions and Enhancements - D:\wav5\DEFS\Test.db2
Welcome
Performance Capacity, and Availability Enhancements
Client /Server and Open Systems
User Productivity
Frequently Requested Enhancements
Additional usability enhancements include:
* Web server gateways,
* Year 2000 date formats,
* prevention of long-running units of work,
* security server support,
* copying of packages to remote servers,
* and more...
See Release Guide for an overview of these enhancements.
DB2 issues warning messages, at intervals of your choice, to inform you about in doubt units of recovery (URs) or long-running URs that did not commit.
Select the Set Options button to define the period of time you want DB2 to wait before issuing the warning message, in the "Checkpoint cycles before UR warning" field.
Set options...
<-Back
Next->

FIG. 12

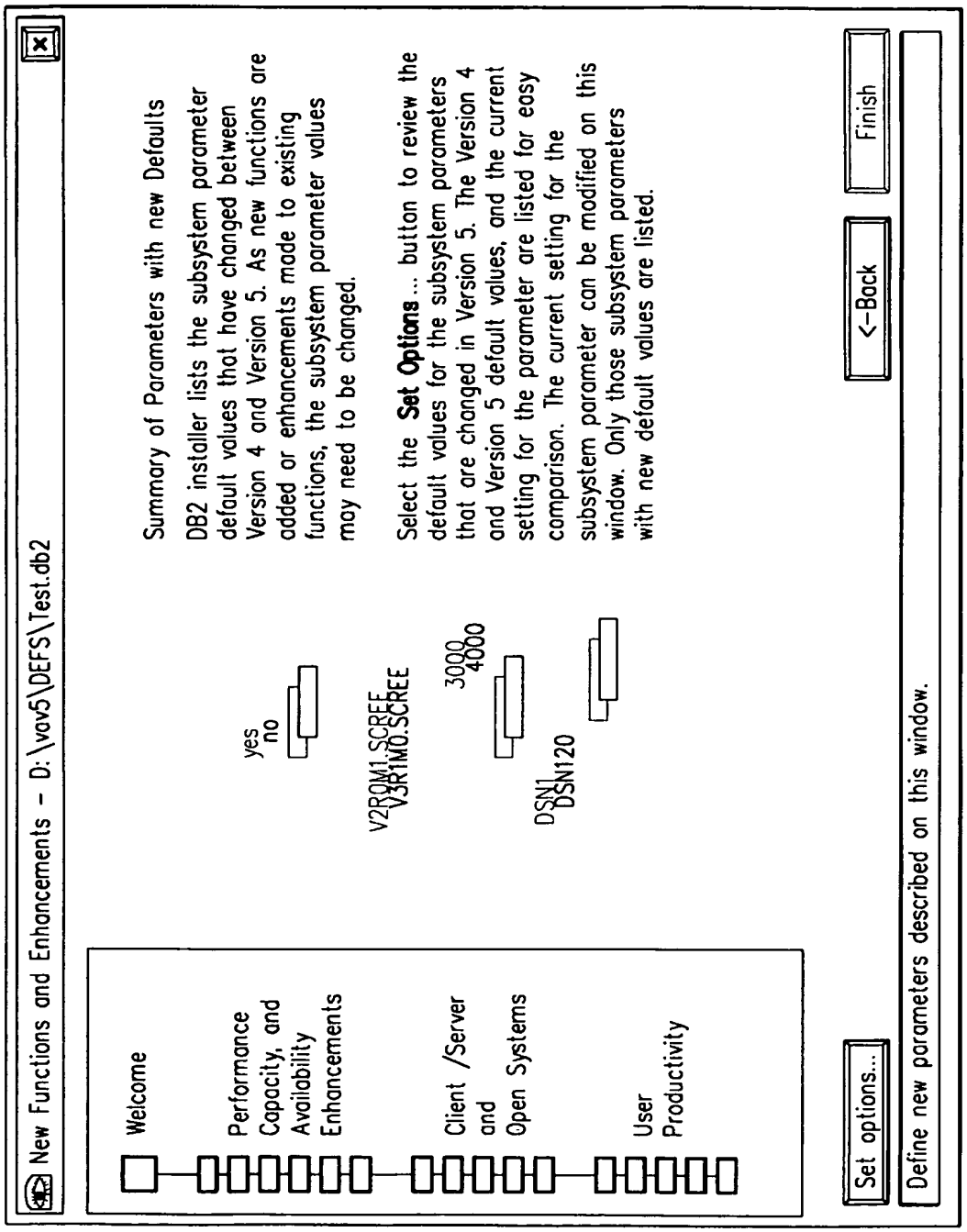

New Functions and Enhancements - D: \vav5\DEFS\Test.db2
Welcome
Performance Capacity, and Availability Enhancements
Client /Server and Open Systems
User Productivity
Summary of Parameters with new Defaults
DB2 installer lists the subsystem parameter default values that have changed between Version 4 and Version 5. As new functions are added or enhancements made to existing functions, the subsystem parameter values may need to be changed.
Select the Set Options... button to review the default values for the subsystem parameters that are changed in Version 5. The Version 4 and Version 5 default values, and the current setting for the parameter are listed for easy comparison. The current setting for the subsystem parameter can be modified on this window. Only those subsystem parameters with new default values are listed.
yes
no
V2R0M1.SCREE
V3R1M0.SCREE
3000
4000
DSN1
DSN120
Set options...
<-Back
Finish
Define new parameters described on this window.

FIG. 13

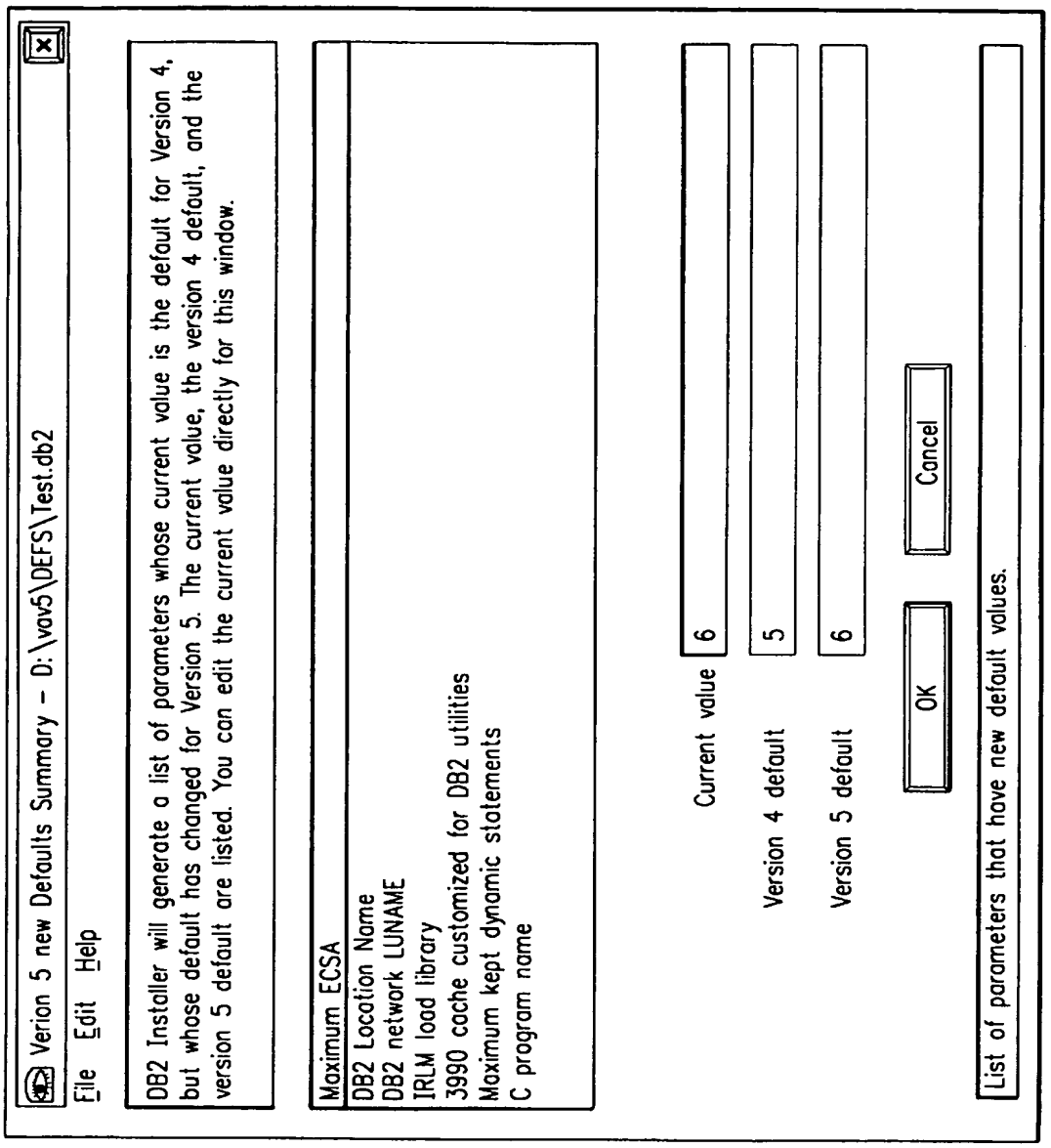

Verion 5 new Defaults Summary - D:\vav5\DEFS\Test.db2
File Edit Help
DB2 Installer will generate a list of parameters whose current value is the default for Version 4, but whose default has changed for Version 5. The current value, the version 4 default, and the version 5 default are listed. You can edit the current value directly for this window.
Maximum ECSA
DB2 Location Name
DB2 network LUNAME
IRLM load library
3990 cache customized for DB2 utilities
Maximum kept dynamic statements
C program name
Current value
6
Version 4 default
5
Version 5 default
6
OK
Cancel
List of parameters that have new default values.

FIG. 14

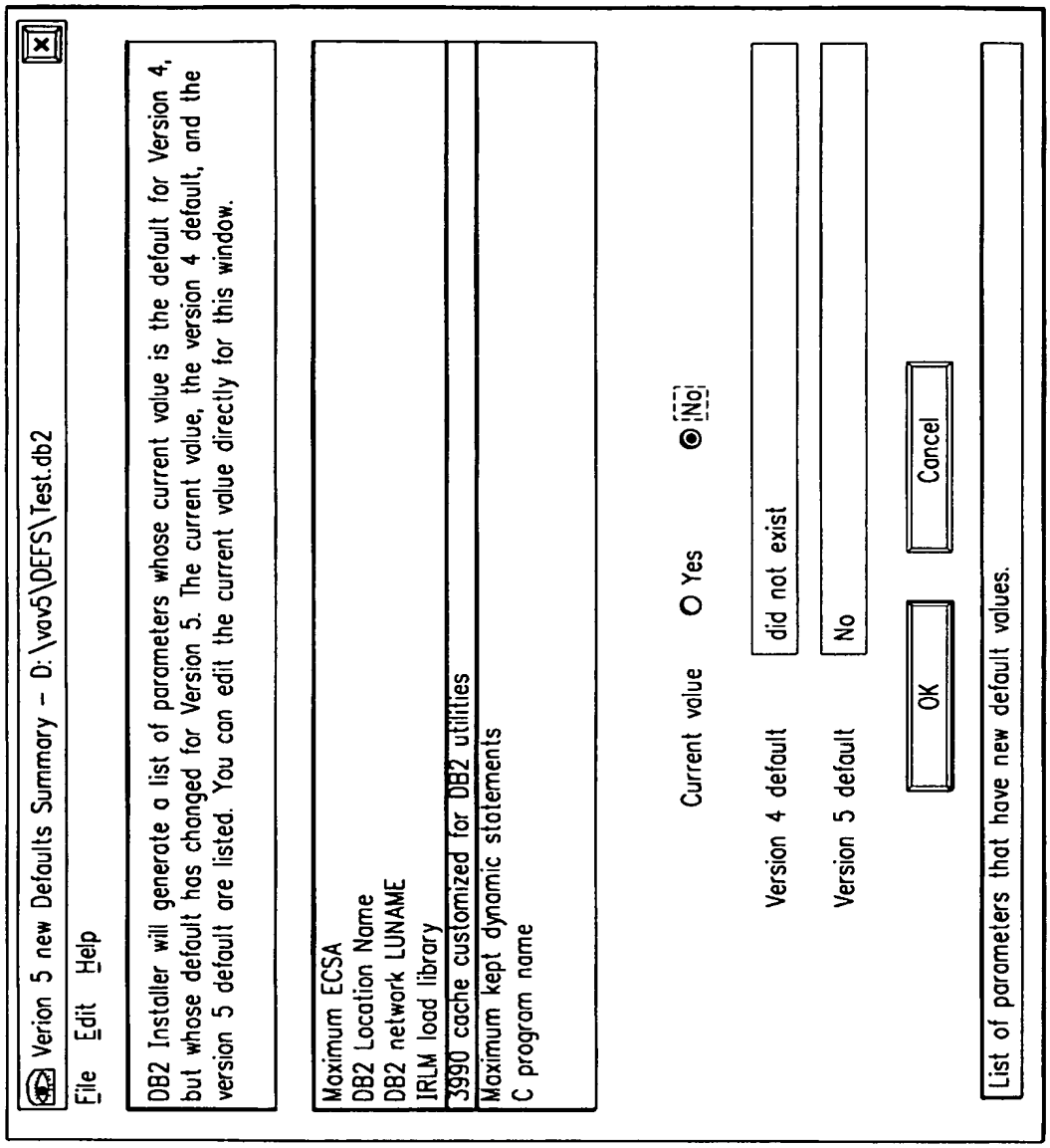

Verion 5 new Defaults Summary – D: \vav5\DEFS\Test.db2
File Edit Help
DB2 Installer will generate a list of parameters whose current value is the default for Version 4, but whose default has changed for Version 5. The current value, the version 4 default, and the version 5 default are listed. You can edit the current value directly for this window.
Maximum ECSA
DB2 Location Name
DB2 network LUNAME
IRLM load library
3990 cache customized for DB2 utilities
Maximum kept dynamic statements
C program name
Current value
Yes
No
Version 4 default
did not exist
Version 5 default
No
OK
Cancel
List of parameters that have new default values.

FIG. 15

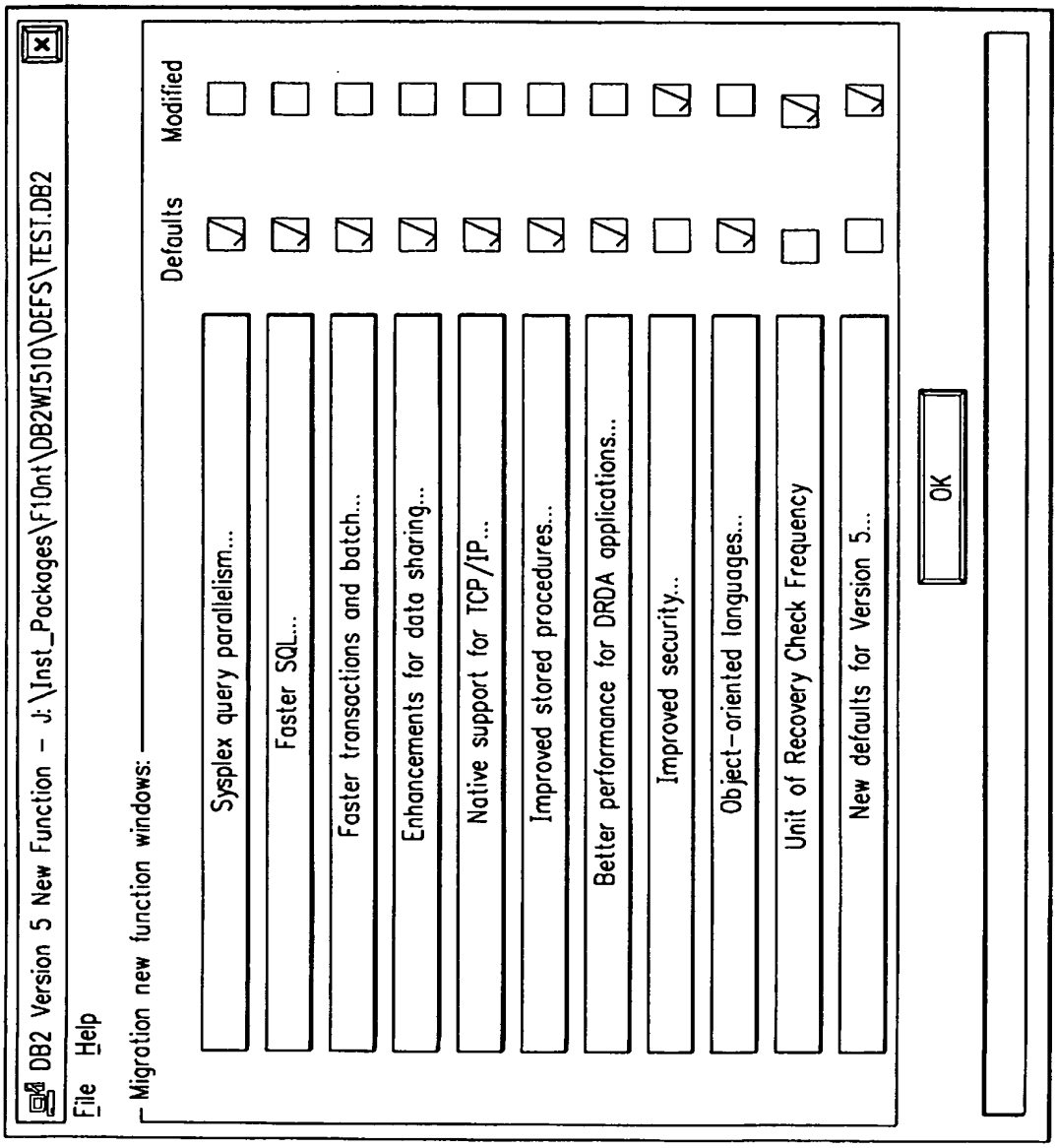

DB2 Version 5 New Function - J:\Inst_Packages\F10nt\DB2W1510\DEFS\TEST.DB2
File Help
Migration new function windows:
Defaults
Modified
Sysplex query parallelism...
Faster SQL...
Faster transactions and batch...
Enhancements for data sharing...
Native support for TCP/IP...
Improved stored procedures...
Better performance for DRDA applications...
Improved security...
Object-oriented languages...
Unit of Recovery Check Frequency
New defaults for Version 5...
OK

FIG. 16

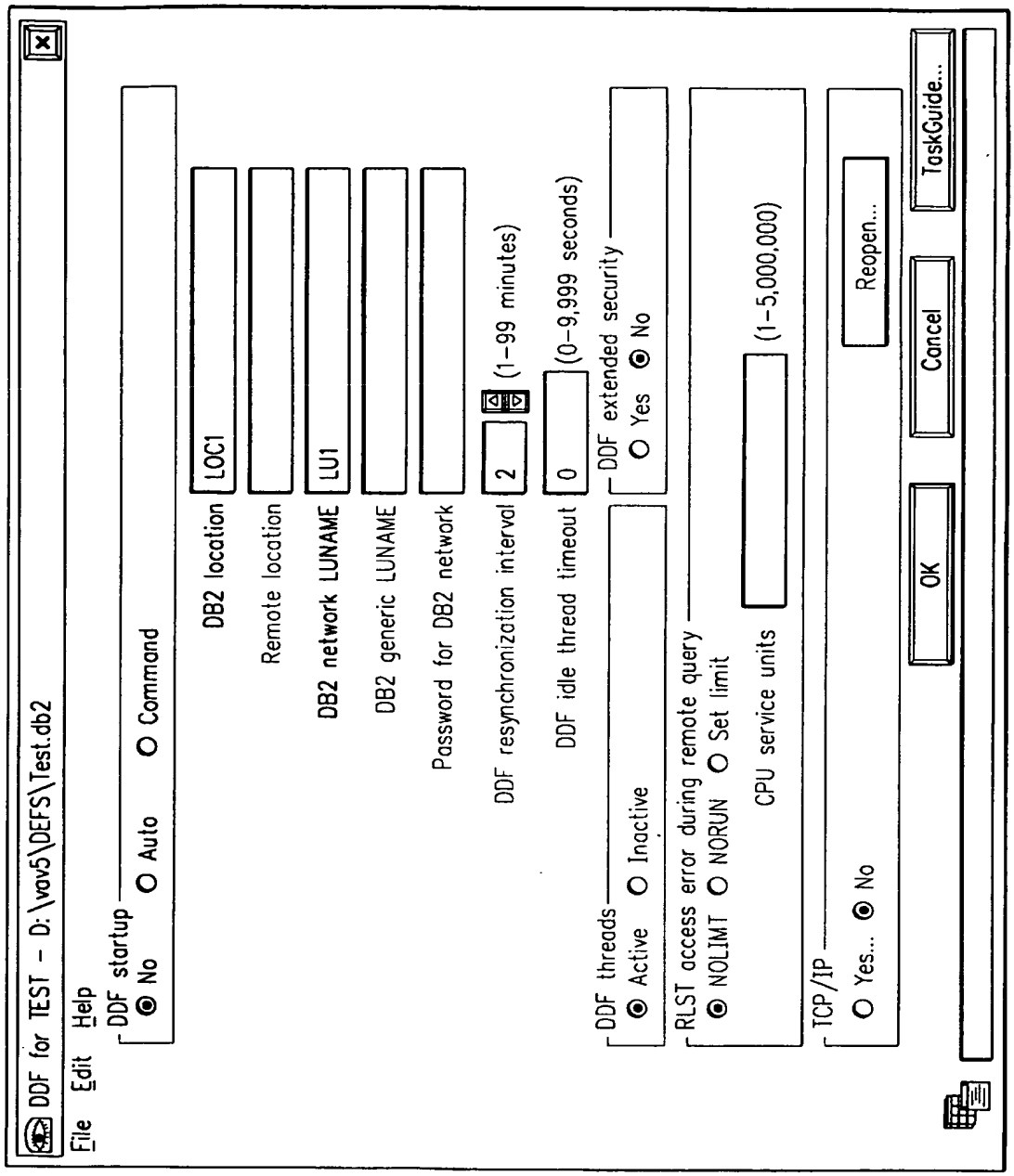

DDF for TEST - D:\vav5\DEFS\Test.db2
File Edit Help
DDF startup
No
Auto
Command
DB2 location
LOC1
Remote location
DB2 network LUNAME
LU1
DB2 generic LUNAME
Password for DB2 network
DDF resynchronization interval
2
(1-99 minutes)
DDF idle thread timeout
0
(0-9,999 seconds)
DDF threads
Active
Inactive
DDF extended security
Yes
No
RLST access error during remote query
NOLIMT
NORUN
Set limit
CPU service units
(1-5,000,000)
TCP/IP
Yes...
No
Reopen...
OK
Cancel
TaskGuide...

FIG. 17

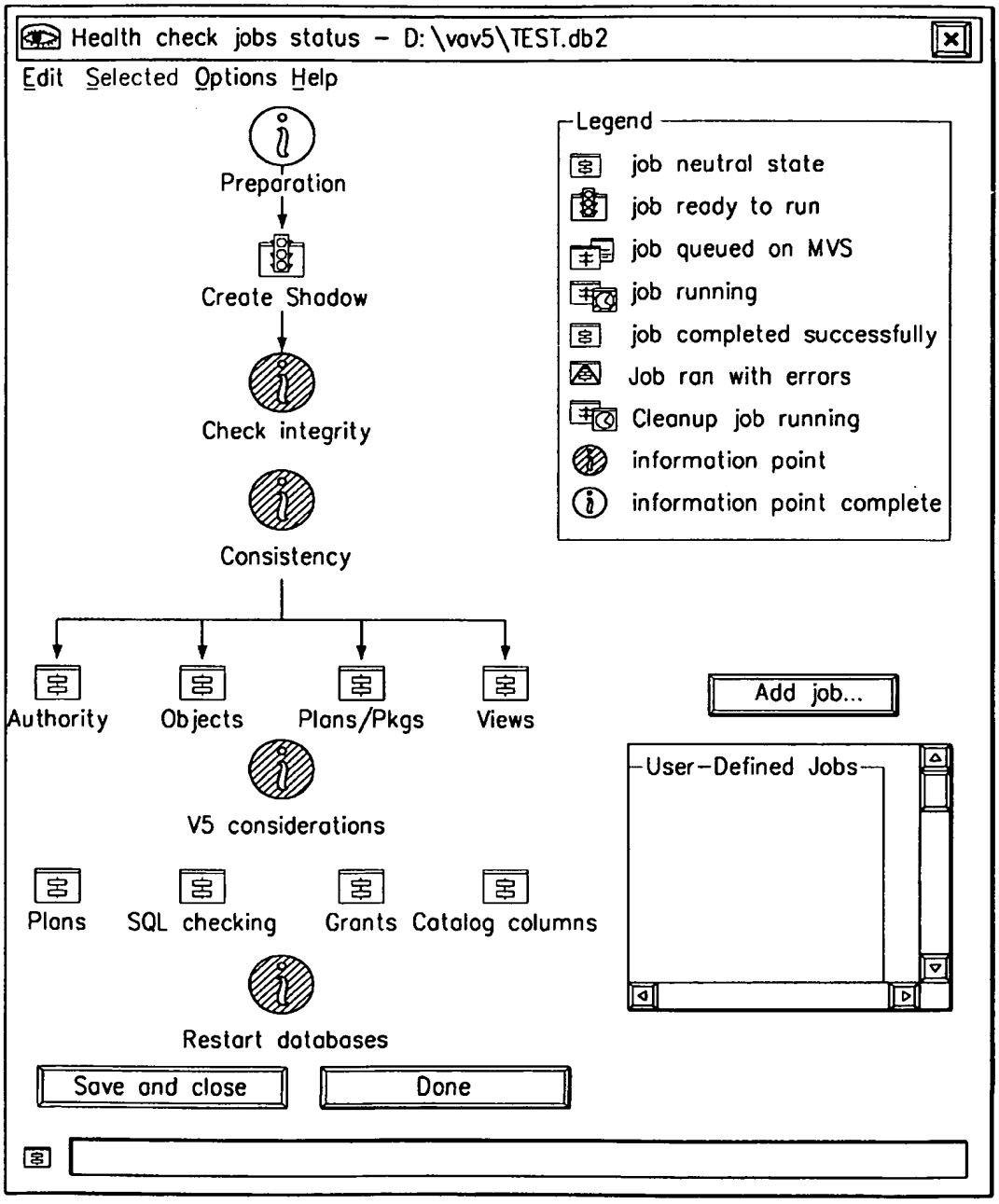

Health check jobs status - D:\vav5\TEST.db2
Edit Selected Options Help
Preparation
Create Shadow
Check integrity
Consistency
Authority
Objects
Plans/Pkgs
Views
V5 considerations
Plans
SQL checking
Grants
Catalog columns
Restart databases
Save and close
Done
Legend
job neutral state
job ready to run
job queued on MVS
job running
job completed successfully
Job ran with errors
Cleanup job running
information point
information point complete
Add job...
User-Defined Jobs

FIG. 18

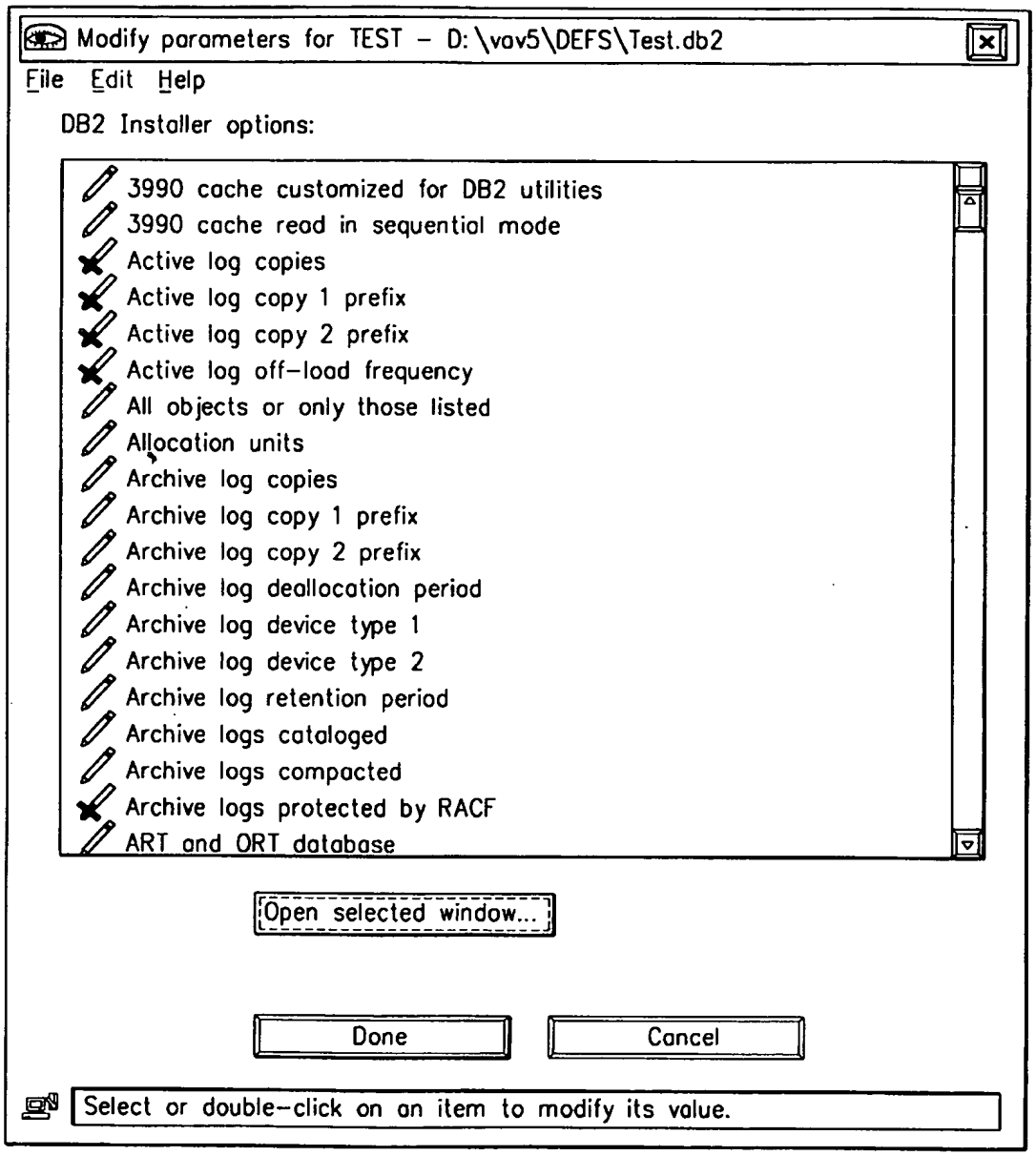

Modify parameters for TEST – D:\vav5\DEFS\Test.db2
File Edit Help
DB2 Installer options:
3990 cache customized for DB2 utilities
3990 cache read in sequential mode
Active log copies
Active log copy 1 prefix
Active log copy 2 prefix
Active log off-load frequency
All objects or only those listed
Allocation units
Archive log copies
Archive log copy 1 prefix
Archive log copy 2 prefix
Archive log deallocation period
Archive log device type 1
Archive log device type 2
Archive log retention period
Archive logs cataloged
Archive logs compacted
Archive logs protected by RACF
ART and ORT database
Open selected window...
Done
Cancel
Select or double-click on an item to modify its value.

FIG. 19

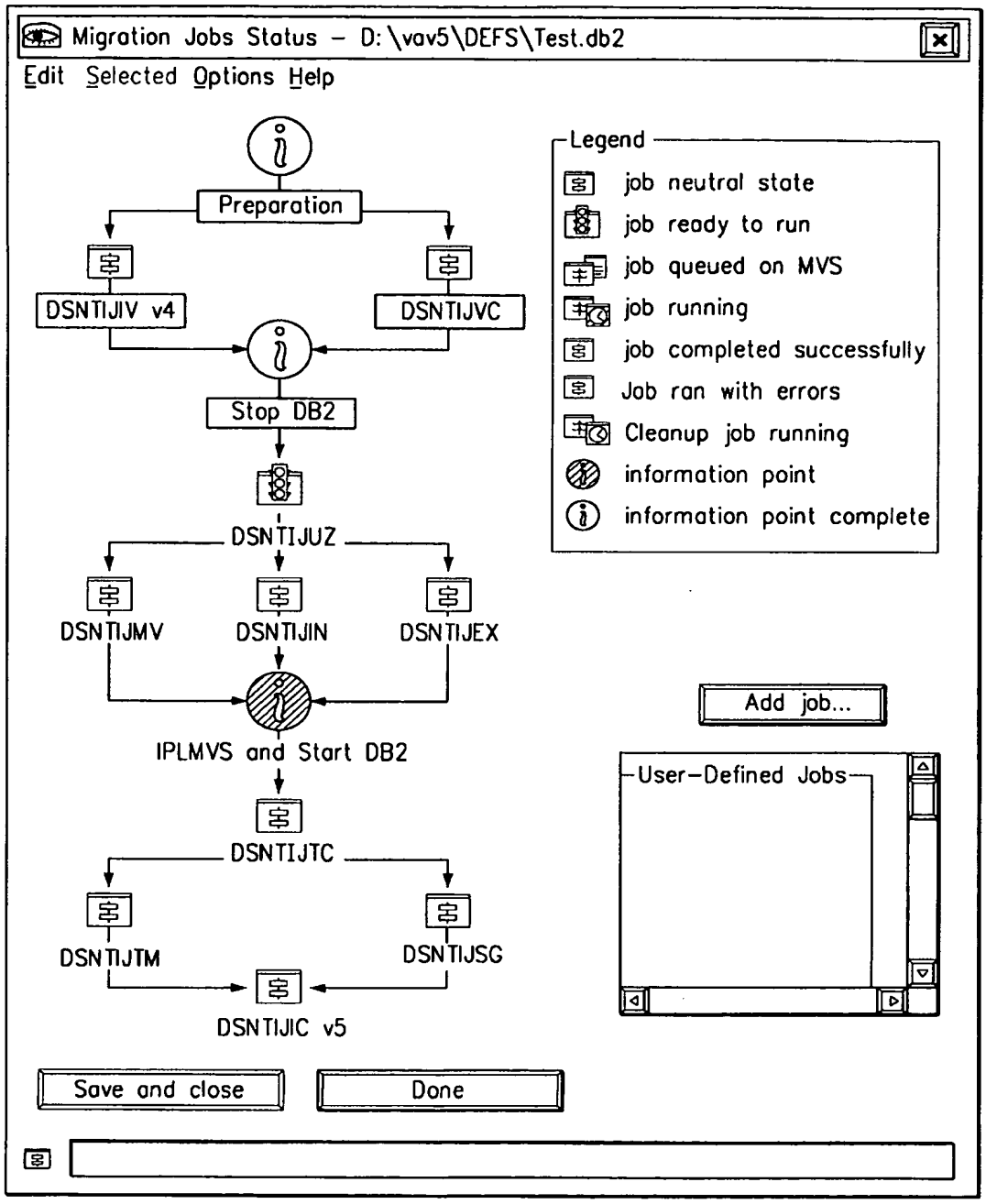

Migration Jobs Status – D:\vav5\DEFS\Test.db2
Edit Selected Options Help
Preparation
DSNTIJIV v4
DSNTIJVC
Stop DB2
DSNTIJUZ
DSNTIJMV
DSNTIJIN
DSNTIJEX
IPLMVS and Start DB2
DSNTIJTC
DSNTIJTM
DSNTIJSG
DSNTIJIC v5
Legend
job neutral state
job ready to run
job queued on MVS
job running
job completed successfully
Job ran with errors
Cleanup job running
information point
information point complete
Add job...
User-Defined Jobs
Save and close
Done

FIG. 20

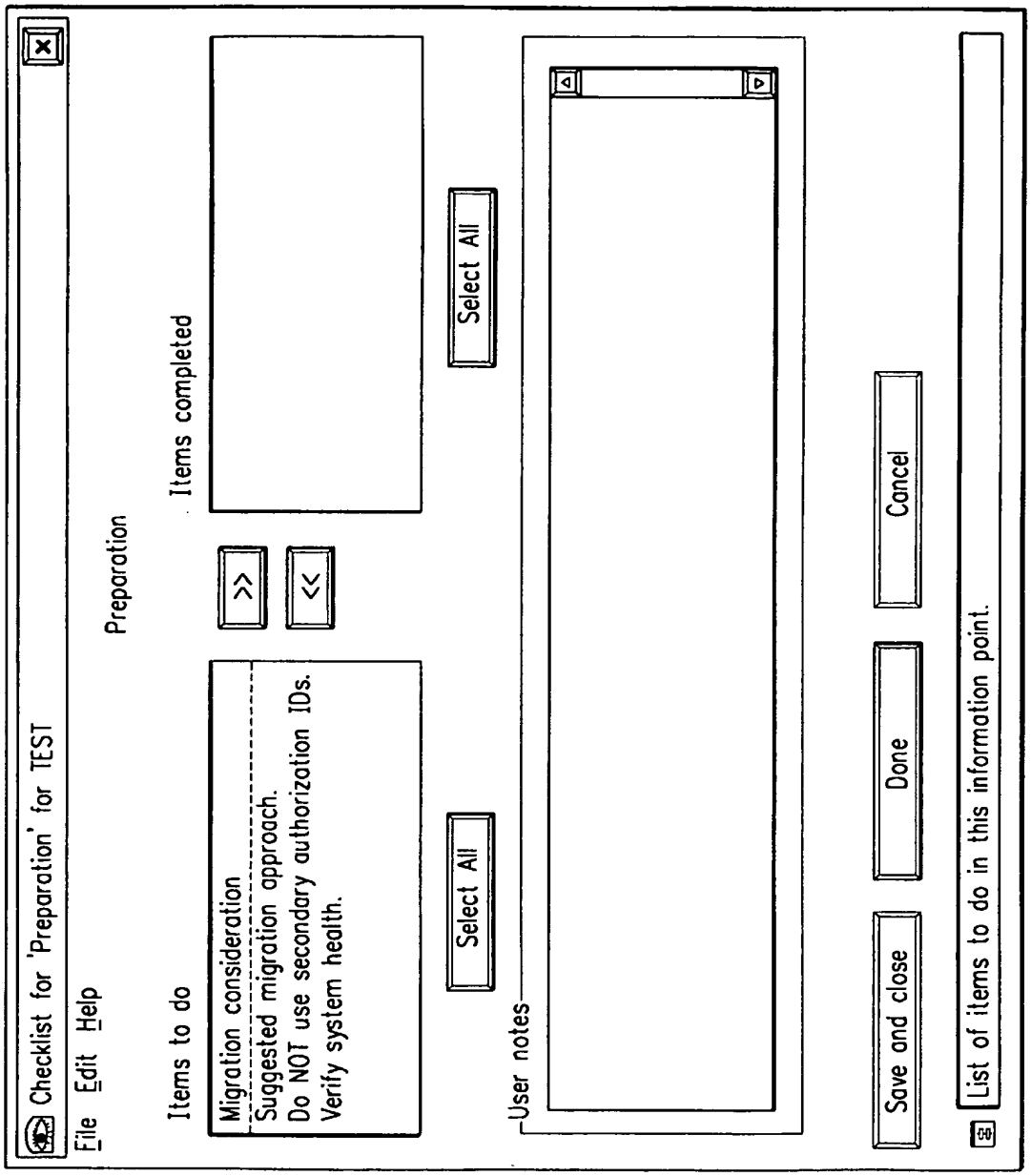

Checklist for 'Preparation' for TEST
File Edit Help
Preparation
Items to do
Migration consideration
Suggested migration approach.
Do NOT use secondary authorization IDs.
Verify system health.
>>
<<
Items completed
Select All
Select All
User notes
Save and close
Done
Cancel
List of items to do in this information point.

FIG. 21

METHOD AND APPARATUS FOR PERFORMING A HEALTH CHECK ON A DATABASE SYSTEM

This application claims the benefit of U.S. Provisional Application Ser. No. 60/069,628 filed Dec. 15, 1997. This application is also related to the following applications, filed on the same day as the present application: Ser. No. 09/058,170, entitled "Method And Apparatus For Setting Parameters In A System"; Ser. No. 09/058,171, entitled "Method And Apparatus For Polling Job Status On A Mainframe System"; Ser. No. 09/058,172, entitled "Method And Apparatus Of Indicating Steps In A Task Which Have Been Completed"; and Ser. No. 09/058,173, entitled "Method And Apparatus For Generating A Default List."

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a method and apparatus for directing and assisting a user through procedures of a program required to perform various tasks on a complex software system.

2. Description of the Related Art

It is known that the installation of software systems on mainframe computers requires entry of many parameters and accomplishment of a large number of steps before the software is ready to run. During the installation process, an entry error or other mistake can result in substantial time being expended to debug the data that has been entered. The prior art has attempted to cope with this problem through a system that helps the user through the installation process.

One example of such prior art is disclosed in the IBM Technical Disclosure Bulletin (TDB), Volume 34, No. 11, April 1992 at page 174. There, it is noted that a local area network distribution system requires a large number of user actions to set up a workstation to remotely install a local area network (LAN) requester program. Previously, the LAN administrator would be required to create map files manually for all requesters that require remote installation. The IBM TDB article suggests that a preprocessor be used to help the LAN administrator customize the set-up for remote requesters. The preprocessing program creates a map file for each workstation wherein a requester program is to be installed. For each requester, the LAN administrator inputs the requester's name, domain name and drive where the program will be installed. The preprocessing program reads these input parameters and creates a map file with appropriate default values. The preprocessing program is said to reduce the chance of user error by utilizing predefined inputs and by displaying appropriate error messages.

It is further known to direct a user through the various steps that are required for installing an application program. However, such installation instructions are generally set out as a listed series of tasks to accomplish, with little information being given as to their interrelationship, the status of various subtasks which comprise the overall task, or the overall relationship of the various subtasks to each other and to the task as a whole.

In fact, to successfully install a complex program, it is often a necessity that the user be an expert on how to install the program, on how to adapt and/or alter parameters that are inserted during the installation procedure, etc.

SUMMARY OF THE INVENTION

The present invention overcomes these and other shortcomings of prior systems, by accomplishing the objective of

providing an improved method, apparatus and article of manufacture for assisting a user via a program on a workstation, running under an operating system and being connected to a mainframe computer.

More specifically, the present invention provides an improved method, apparatus and article of manufacture for polling the status of jobs requested by the user of a workstation, where the jobs are being executed on a mainframe. The present invention does so by continuously polling to determine when a particular output file is present. When the output file is found to be present, the user is given an indication of the status of the job originally requested by the user.

The present invention also provides an improved method, apparatus and article of manufacture for assisting the user in setting parameters during loading of System Modification Program Extended (SMPE) libraries, installation, migration, fallback, remigration and update tasks of a program. Loading of SMPE libraries refers to a preinstallation which takes place prior to installation. Installation refers to the initial load of a program, while migration refers to moving from an older to a newer version of the program. Fallback is used to return to a state where the older version of the program is operational without uninstalling the newer version. Remigration is used to return to the newer version of the program when the reason for the fallback is resolved. Finally, an update is used to provide upgrades in the current version of the program.

When the user is in the process of setting parameters, the user is initially asked to choose one of two options to select system parameters. If the first option is selected, the user is presented with a series of information windows regarding the parameters. Within each of the windows, the user may select to change the associated parameter. If the user chooses to change the associated parameter, the system goes from the information window to a predefined window in which the parameter can be changed. Once this is done, the user is returned to the information window last viewed by the user. If the second option is used, the user is given a list of the predefined windows, each of which may be selected by the user to change an associated parameter.

The present invention also provides an improved method, apparatus and article of manufacture for providing an indication to a user of a workstation as steps of a task have been completed. The tasks include load SMPE libraries, install, migrate, fallback, remigrate and update. Each step in a task is represented by a button in a window. Behind each button is a text field of a color different from the background color of the window and which is also of a color different from that of the button. Additionally, the text field is larger than the button. Initially, the text field is hidden. This indicates that the task indicated on the button is not yet complete. When the user completes a task indicated by the button, the text field behind that button is shown. Since the text field is larger than the button and is in a color different from the background color of the window and from the button itself, when shown, the text field, appears to provide a highlighted border around the button. Thus, the user can determine which steps of a task have been completed by looking to see which step buttons have a highlighted border.

The present invention further provides an improved method, apparatus and article of manufacture for checking the integrity of catalog and directory databases before a migrate task, for example, is performed on the databases. This is done by performing a series of jobs to verify the integrity of the catalog and directory databases.

The present invention also provides an improved method, apparatus and article of manufacture for providing information, in the form of a defaults list, to the user of a program regarding parameters whose default values have changed, which parameters are of particular concern to the specific user. During a migrate task, for example, a list of parameters is generated. This list is displayed with only those parameters where the default value has changed from the prior version of the program and where a user of the system selected the default value of the parameter in the prior version of the program. This allows a user of the system to easily view parameters having new default values, where a user had selected the default values of the parameters in a prior version of the program.

BRIEF DESCRIPTION OF THE DRAWINGS

The above objects and advantages of the present invention will become more apparent by describing, in detail, preferred embodiments thereof with reference to the attached drawings in which:

FIG. **1** shows a block diagram of a system that is particularly adapted to perform the method of the invention.

FIG. **2** shows a welcome window, which is initially presented to the user of the workstation, giving the user the option of performing, inter alia, preinstall, install, migrate, fallback, remigrate and update tasks.

FIG. **3** shows a window which directs a user in opening a DB2 Installer file for migration.

FIG. **4** shows a window which lists the steps to be completed by a user for a migration task.

FIG. **5** shows the window which allows a user to load a DSNTIDxx file from either a workstation or a host.

FIG. **6** shows a window where the user provides information needed to download the DSNTIDxx file from the host.

FIG. **7** shows a window which allows the user to select between a TaskGuide route and an expert route to set up DB2 parameters.

FIG. **8** shows the logical connection between the user's options of selecting either the TaskGuide route or the expert route.

FIG. **9** shows the TaskGuide window entitled "Sysplex Query Parallelism."

FIG. **10** shows the predefined install window presented to the user when the user indicates a desire to change parameters relating to "Sysplex Query Parallelism."

FIG. **11** shows another TaskGuide window entitled "Enhancements for Data Sharing."

FIG. **12** shows another TaskGuide window entitled "Frequently Requested Enhancements."

FIG. **13** shows another TaskGuide window entitled "Summary of Parameters with New Defaults."

FIG. **14** shows another TaskGuide window entitled "Version 5 New Defaults Summary."

FIG. **15** shows another version of the TaskGuide window entitled "Version 5 New Defaults Summary."

FIG. **16** shows a window presented to the user when the expert route is selected.

FIG. **17** shows an predefined install window presented to the user when the user indicates a desire to change the parameters shown.

FIG. **18** shows a job status window relating to a test for system health.

FIG. **19** shows a window listing DB2 Installer options and indicates whether or not the options are modifiable.

FIG. **20** shows a job status window relating to running jobs.

FIG. **21** shows an example of an Info Point window.

DETAILED DESCRIPTION OF THE INVENTION

A preferred embodiment of the present invention is described below in detail with reference to the accompanying drawings. The present invention will be described in the context of the DB2 database manager or system which assists a user of a workstation operating under an operating system such as Windows NT to load SMPE libraries, install, migrate, fallback, remigrate or update a complex database system on a mainframe computer with an operating system having a nonstandard file structure and lacking an application program interface (API) to a workstation operating system, e.g. an MVS or OS/390 mainframe computer. Windows NT is a trademark of the Microsoft Corporation DB2 and MVS are registered trademarks of International Business Machines Corporation (IBM) and OS/390 is a trademark of IBM. The procedures are carried out at the workstation under control of the program. While the following discussion is presented in the context of a workstation operating under Windows NT and connected to an MVS or OS/390 mainframe computer with DB2, it is to be understood that the present invention is widely applicable to assisting the user through many interactions with complex programs on different systems.

FIG. **1** shows a system to which the program of the present invention may be applied. In FIG. **1**, a user computer or workstation **10** is connected to a mainframe computer **12** on which a database system **14** is disposed. Tasks such as load SMPE libraries, install, migrate, fallback, remigrate or update, initiated by a user at user computer **10**, may be applied to database system **14**. In this instance, it will be assumed that the database system is the DB2 database, a product of IBM, although other database systems are equally applicable. IBM is a registered trademark of the International Business Machines Corporation. Since proper application of any of the load SMPE libraries, install, migrate, fallback, remigrate or update tasks to the DB2 database **14** may require the customization of hundreds of parameters and performance of many interrelated functions, it has been usually carried out by an expert, directly at an interface with computer **12**.

The provision of user computer **10** and certain software systems installed thereon provides to the relatively unskilled user, the means to accomplish any of the load SMPE libraries, install, migrate, fallback, remigrate or update tasks. The user computer **10** includes a central processing unit (CPU) **16**, a display **18**, a user input **19** and a memory **20**, all of which are coupled via bus system **22**. Communications between computer **10** and mainframe computer **12** are carried out via an input/output module **24**.

In order to accomplish any of the tasks, the program initially presents to the user of workstation **10** on display **18**, the welcome window shown in FIG. **2**. This welcome window allows the user to select one of the several tasks which may be performed on a DB2, or another database system, including the load SMPE libraries, install, migrate, fallback, remigrate and update tasks. The user indicates his/her selection by providing input via user input **19**. Once the user has selected which task to execute, the user is then presented with a window which lists the steps needed to

complete a task. This will be discussed in more detail below. The window listing the steps will allow the user to perform such steps as importing values from a previous version of the database system, specifying new function values, modifying his/her options, generating jobs, running jobs and running samples.

The various tasks which may be performed on DB2 will now be discussed in more detail. It shall be understood, however, that tasks will vary from program to program and that the underlying invention will be more generally applicable to the initial setup of complex programs. Over time, there have been different versions of the DB2 database. If a user wishes to go from an old version to a new version, then a task known as migrate is performed. The present invention adds the capability to support this migration function on workstations operating, for example, under Windows NT. Most people who have bought the recently released Version 5 of DB2 already have Version 4. So rather than installing Version 5 of DB2 from a Windows NT workstation, the present invention provides the ability to take Version 4 of DB2 and migrate it to Version 5. The migration results in all the added functionality of Version 5.

The heart of a DB2 database is catalog and directory tables. One difference between the catalog tables of Version 4 and Version 5 of DB2 is that the Version 5 catalog tables have some additional columns. After a successful DB2 migration, the user's application may or may not perform as desired. A user can return to the previous DB2 application without uninstalling the new DB2 version. This is called a fallback. After a fallback task is performed, the new columns of the Version 5 catalog are maintained. The only difference after a fallback is that those new columns are now hidden to a user of Version 4 of the DB2.

Once a fallback is performed and the new Version 5 catalog columns are hidden, the user must then determine the reason for which the original application did not perform as desired. The fallback allows the user of the system to still use the data in the Version 4 DB2 database while the reason for the undesirable application performance is determined.

Once the reason necessitating the fallback is addressed, a remigrate task may be performed. The remigrate is different from the migrate, in that all of the prior work is not lost. Essentially, during a remigrate, the new Version 5 DB2 columns that were hidden by the fallback are shown and functions that were made unavailable at fallback are now supported.

Another task which may be performed upon DB2 is an update. If, for example, the user already has Version 5 DB2 installed and wants to change a parameter, the update task may be used. This task does not result in a change in the version of DB2 used, but simply allows a parameter to be changed.

Regardless of which task is being performed, load SMPE libraries, install, migrate, fallback, remigrate or update, three basic steps are followed. The first step is to set the parameters. DB2 has on the order of 400 different parameters (e.g. set COBOL as the default language). Other database systems also have large numbers of parameters. Each of these parameters may be set using graphical user interfaces (GUIs), which direct the user through the parameter setting process. The parameters may be set by the user using a workstation, which need not be connected to the mainframe host. Once the parameters have been set, the second step is carried out. Namely, jobs are generated. In MVS or OS/390 jargon, jobs refer to a batch of work that needs to be done. Again, the job is generated at the workstation and is saved on the workstation. Optionally, the job may be uploaded to the host system (MVS or OS/390). The third step is to run the job. The workstation, running under Windows NT for example, has a job status window which lists in an icon format all of the jobs that need to be run for a particular task and provides the status regarding each of the jobs. These are the three basic steps which need to be accomplished to complete a task. Sometimes, extra steps may need to be performed and, at other times, not all three of the basic steps need be performed.

Initially, the step of generating and running jobs is discussed in the context of the install task. Utilities and APIs are used to connect the MVS or OS/390 host to a workstation operating under Windows NT, for example. In the example discussed below, MVS is basically a mainframe computer, e.g. the OS/390 product from IBM, and the subsystem is a DB2 subsystem on the mainframe.

DB2 Installer is a workstation based tool which allows a user to perform the task of installing DB2 for MVS or OS/390. In the case of the DB2 Installer, the user begins with an MVS or OS/390 host and must use the install task to put the DB2 subsystem on the MVS or OS/390 host. The user must accomplish this task using jobs. During the install, the user of the workstation is asked, through a GUI, for the values desired for the parameters for the DB2 subsystem. Once this is done, jobs on the workstation are generated and saved on the workstation.

A connection between the workstation and the host is then established using, for example, a TCP/IP connection, although other types of connections are possible. The TCP/IP connection is used to send the jobs that were generated on the workstation to the host. The jobs are logged on a queue file called JES Queue. On MVS or OS/390, there is a normal file structure, which works just like it would in DOS or in any other operating system. The JES Queue is a little different in that it is a repository to which jobs are sent to be run on the host. It is the jobs which actually perform the work of installing the DB2 subsystem. After the jobs are run, return codes are generated and sent back to the workstation. These are used to inform the user at the workstation whether the job ran successfully or not. Feedback to the user as to the status of the job is easy to provide for a workstation operating under the OS/2 operating system, because OS/2 readily allows access of status information from the JES Queue. OS/2 is a registered trademark of IBM. In OS/2, there is an API which allows for communication with the JES Queue using file transfer protocol (FTP). This API is needed to communicate with the JES Queue because the JES Queue is a repository which does not have a normal file structure.

This procedure allows the user of a workstation operating under OS/2 installing DB2, for example, a way to submit jobs and get feedback by getting the output of the job from the JES Queue. However, this procedure is not directly available for a user of a workstation operating under Windows NT. This is so because jobs to be run on the mainframe must first be sent to the JES Queue to be logged. Additionally, access to the JES Queue is needed to provide sufficient knowledge to determine the status of the jobs. However, Windows NT cannot communicate with the non-standard file structure of the JES Queue. Windows NT lacks the API of OS/2 which uses FTP to communicate with the JES Queue. Because the JES Queue lacks the standard file structure, as discussed above, and because Windows NT lacks the API of OS/2, Windows NT cannot communicate directly with the JES Queue.

The present invention provides a solution for this problem. In accordance with the present invention, for a work-

station operating under Windows NT, for example, instead of directly using an FTP API, a standard command prompt in Windows NT is used to submit a series of MVS commands in the form of a single file to the host. This is accomplished by using the command prompt to submit templates of FTP commands which are edited and then sent to the host along with the job to tell the host what to do. The FTP command templates include a template for GET (to retrieve files), a template for PUT (to place or send files) and a template for DIR (to obtain directory listings).

Discussing this process in more detail, from the user's perspective this entire process will be completely transparent. The user simply uses a GUI to assign a name to a job and indicate that he/she wishes to run the job. At this point the TCP/IP connection to the host has already been set up. Then, transparent to the user, the template for the FTP PUT command is accessed and filled in with the correct commands and job name. The template is then executed, which causes the job to be put on the JES Queue and the JES Queue then handles running it. When the job is done, the JES Queue has a specific output file that it puts out. In order to determine when the job is done, the JES Queue is polled using a series of FTP templates for DIR. Essentially, this performs a directory check on the JES Queue each time the FTP DIR command template is executed. Based upon the file name of the job, the name of the output file on the JES Queue is known. The polls are continued, DIR after DIR after DIR, until the specific output file appears on the JES Queue. Then the FTP GET template is used to grab the output file and bring it down to the workstation. The user of the workstation is then given an indication that the job is complete. Thus, the present invention provides the capability of apprising the user of a workstation, operating under Windows NT, for example, of the status of jobs being run on the host.

Turning now to the step of setting parameters, as noted above, the user of a workstation operating under Windows NT, for example, is initially presented with the welcome window shown in FIG. 2. This window presents to the user the different tasks which may be executed. The window lists, inter alia, the preinstall, migrate, install, fallback, remigrate and update tasks, which may be selected by the user. In FIG. 2, it can be seen that the task "Migrate a DB2 from Version 4 to Version 5" has been selected. For ease of understanding, the remainder of our discussion will focus on this selected migration task. However, it should be kept in mind that a corresponding discussion applies to the other tasks of load SMPE libraries, install, fallback, remigrate and update as well as to other similar functions. Once again, while the following discussion takes place in the context of DB2, the general principles are widely applicable to other database systems.

Once the user has selected the "Migrate a DB2 from Version 4 to Version 5" task option and has clicked on the "OK" button, the user is then presented with the window shown in FIG. 3. This window directs the user in opening a DB2 Installer file for migration and gives the user the option of filling in a field to indicate the name of the DB2 subsystem to be put on the host. Alternatively, the user can click on a browse button to browse for a subsystem name. If the user fills out a subsystem name, that name plus the extension ".DB2" will be used as the default name in the ensuing file dialog. If the user clicks on the browse button without first filling out the subsystem name, the default filename will be "*.DB2". In either case, if it is determined that the user has selected an already existing subsystem name, that indicates that the named subsystem file must be already in the process of being migrated. If the user is beginning a new migration, a unique subsystem name must be selected. After the user fills in or selects the name of the subsystem, the OK button is enabled. When the user clicks on the OK button, the user is presented with the window shown in FIG. 4. FIG. 4 provides to the user a list of steps which are to be taken to complete a task, in the present case, migrate. Similar windows are presented to users, listing the steps for executing the load SMPE libraries, install, fallback, remigrate and upgrade tasks.

The first step to be completed by the user for the migrate task is to "Load existing options." Existing options are parameters that were set in the previously installed version of the program, in this case, DB2 Version 4. In a preferred embodiment, the previously set parameters are saved in a file created during the prior installation. Once the user selects this button, shown in FIG. 4, the user is presented with the window shown in FIG. 5. Existing options and parameters, as they were set in Version 4 of DB2, can be found in a file called, for example, DSNTIDxx, which was the output of the install process for Version 4. A user can use a filename other than DSNTIDxx, or can use multiple files. This file may either be stored on the workstation or on the host. FIG. 5 shows the window which allows the user to load the DSNTIDxx file using one of two options. First, the user can use FTP to download the file from the host by selecting the "Download DSNTIDxx from host" button or second, the user can load the file from the workstation by selecting the "Locate DSNTIDxx on workstation" button.

If the user selects the first option, to download the file from the host, the user must provide information that will allow the installer to locate the file on the host. For example, in the described environment, this information may include the host name, the user ID and the password using the window shown in FIG. 6. Additionally, the user may provide the partitioned data set member, which is the MVS filename. With this information, FTP is used to locate and download the file, in this case, an MVS file. The file, as downloaded, is in a different format from that which is to be used in the workstation. So, the file, whatever its format, must be parsed to extract all of the options and parameters set up for the previous program version out of the file. Once this is done, the user is provided with information regarding whether or not the file was downloaded and parsed successfully and if it was not successful, the user is provided with reasons.

If the user selects the second option, to load the file from the workstation, the user can use the Browse button, shown in FIG. 5, to select the appropriate file for parsing. Under either option, the user may decide to click on the "Save and close button" shown in FIG. 5. The user may select this button when he/she has not yet completed this step, but wishes to return to it at a later time. If the user chooses to complete this step, after the DSNTIDxx file has been successfully parsed, the user clicks on the DONE button, shown in FIG. 5 and is returned to the window shown in FIG. 4. FIG. 4 indicates that the user has already completed the first step of the migrate task, "Load existing options," as just discussed, by the fact that the button labeled "Load existing options" is highlighted.

It is important to be able to show to the user exactly what steps have been completed. For example, the user could begin the "Load existing options" step shown in FIG. 4. This is an extended process and so it could very well be that the user initiates the step, gets part way through the process and decides that he/she wants to save the work he/she has completed thus far and leave. The user might do this by clicking on the "Save and close" button, as discussed above.

The user would then come back to the saved place at a later time, and the button for the load existing options step, while enabled, would not be highlighted, since the user left the task uncompleted. Thus, it is important to make it clear to the user that just because a button representing a step is enabled does not mean that the step is completed. A separate indication must be provided to the user so that he/she knows that a particular step has been completed.

For users of workstations operating under OS/2, providing an indication that a step of a task had been completed is a simple matter. This is so because OS/2 allows the color of a button to be changed. Thus, for a user working on a workstation operating under OS/2, once a user had completed a step, the color of the button representing that step can be changed to another color, for example, green.

However, this will not work for users of workstations operating under Windows NT, for example. This is so because Windows NT does not allow the color of a button to be changed, as can be done in OS/2. Thus, a new way had to be developed to show the designation of a completed step to the user. The present invention provides the solution. In the present invention, text fields have been placed behind each of the buttons (e.g. the "Load existing options" button, shown in FIG. 4) on the screen representing steps which must be completed for a task. The text fields are in a color that is different from the background color of the window and are also in a color different from that of the buttons. For example, the color of the text fields may be made green, although other colors could be used to indicate a completed task. Additionally, the text fields are larger than the buttons, so that when the buttons are placed on top of the text fields, the text fields show up as a border around the buttons. Taking a single button, initially, the text field behind the button is hidden so the user only sees the button representing a step that must be completed by the user. Only when the user indicates that a particular step is completed, for example, by clicking on a "Done" button or viewing the last window in a series of windows relating to the step, is the text field shown, thereby providing a colored border around the button representing the completed step. If the user were to leave a particular task uncompleted and perform a save and close operation, intending to complete the step at a later time, the text field would not be shown. This process is repeated for each of the steps for a particular task and enables the user to easily see which steps have been completed.

Looking again at FIG. 4, once the "Load existing options" step has been completed, the user can then move on to the "Set up version 5 new function" step. After the user clicks on the button labeled "Set up version 5 new function," the user is taken to the window shown in FIG. 7. At this point, the user has now accessed the Version 4 options and parameters. However there are new functions and new parameters associated with Version 5. This is often the case when new versions of database systems are created. To assist the user in navigating through these new functions and parameters, the present invention provides the users with a TaskGuide to tell users about the new functions and parameters.

Of the new functions and parameters, some need not be set by the user, some may be set by the user and some must be set by the user. A problem arises due to the fact that during a migrate, etc. there are on the order of 100 different predefined install windows in which these different functions and parameters can be set. Intelligence is built in to all these different windows allowing the system to check for certain file types and different types of input. For example, if the user inputs something in one window, that user action may indicate another window must be presented to the user. The present invention maintains all of this intelligence associated with the predefined install windows.

Returning to FIG. 7, it can be seen that the user has two paths to follow to set the functions and parameters. First, the user can select "DB2 Version 5 TaskGuide," to access information regarding the functions and parameters. Second, the more expert user can select "Set up Version 5 options."

FIG. 8 logically shows the choice to be made by the user, in the context of DB2 Version 5, where the user selects one of the two options discussed above. From the box labeled "Choice window," the user either selects the TaskGuide, made of TaskGuide windows, or the Expert window. The Expert window and some of the TaskGuide windows may be linked to the predefined install windows with the intelligence built in.

First, the TaskGuide user option is discussed. Each TaskGuide window provides an explanation of a single associated function or parameter. FIG. 9 shows the second of the TaskGuide windows, where the first window is just a welcome window. On the left side of this figure there is a navigation bar relating to a single task. The navigation bar tells the user that the new functions and parameters are separated into three separate groups: performance, capacity and availability enhancements; client/server and open systems; and user productivity. Each of these groups has several of the new functions and parameters assigned to it. The navigation bar also has a rectangular icon associated with each of these new functions and parameters. When the user has viewed a TaskGuide window associated with a particular new function or parameter, the associated icon on the navigation bar is changed in color, turned green, for example. This allows the user to determine where in the TaskGuide he/she is at present time and where he/she has been. Returning to the right-hand side of FIG. 9, it can be seen that this TaskGuide window is associated with a particular function or parameter called "Sysplex query parallelism."

In FIG. 9, the user may select the Yes button to set the parameter, or may select the No button if the user does not wish to set the parameter. If the user selects the No button, the Next button is enabled so that the user may continue. If user selects the Yes button, the user is then presented with the window shown in FIG. 10, labeled as a DDF window, with fields to be filled out by the user. FIG. 10 is an example of an predefined installation window, which is linked to the TaskGuide window, as shown in FIG. 8. The predefined installation window, which exists in DB2, has intelligence built into it. Such predefined installation windows may exist in other database programs. The user is taken to this predefined installation window to set the parameter associated with the TaskGuide window. This linking of TaskGuide windows and predefined installation windows allows the user to view whatever information is in the predefined windows and receive help for that window, if desired. Once the user selects the "OK" button on the predefined install window, the user is returned to the TaskGuide window he/she was previously viewing, in this case, FIG. 9. The "Next" button will then be enabled, allowing the user to select that button and continue on in the TaskGuide.

In the preferred embodiment of the present invention, in order to keep the process of setting parameters manageable, the user is forced to go to the predefined install window to change the parameters. Alternatively, the user could change the parameters directly in the TaskGuide. In this case, the system would have to also change the parameters in the

predefined install windows. Thus, error checking would have to be implemented, which executes in two different locations: in the TaskGuide itself and in the predefined install windows.

Going back to FIG. **8**, and the preferred implementation, the series of predefined install windows, which are task type windows, can be seen. It should be noted that some of the TaskGuide windows do not have arrows pointing to an predefined install window. This is because in these cases there is nothing for the user to input. Additionally, the arrows from the TaskGuide windows go straight to the predefined install window and back. This makes clear that the predefined install windows are not implanted in the middle of the flow of the TaskGuide windows. Rather, there are links off of the TaskGuide windows to the predefined install windows and links back to the particular TaskGuide window in the TaskGuide from which the link came off.

Turning to FIG. **11**, which shows the "Enhancements for Data Sharing" TaskGuide window, this is an example of a TaskGuide window which does not have "Yes" and "No" buttons. In this case, a check was performed to determine if the user has data sharing and it was discovered that the user did not have this feature. Thus, there is no reason for the user to set the options relating to this feature. In this case, the TaskGuide window is used to tell the user that there are enhancements for data sharing, in the event that the user wishes to take advantage of those enhancements in the future.

Turning to FIG. **12**, we see a TaskGuide window entitled "Frequently Requested Enhancements." Turning to the right side of FIG. **12**, we see that instead of the "Yes" and "No" buttons, the user is presented with a "Set options" button. The user is presented with this button if the user must fill in these parameters. Preferably, the user is not given a choice, but must go to the associated predefined install window, where the user highlights and sets the fields in question and is then returned to the "Frequently Requested Enhancements" TaskGuide window. FIG. **13** similarly requires the user to select the "Set options" button.

Turning now to FIG. **14**, displaying a window labeled "Version 5 New Defaults Summary," this shows the new defaults window. This particular TaskGuide window is another example where, preferably, the user has no choice but to follow through with some sort of action. However, this is one case where the user is not sent to a predefined install window. Rather, the user is sent to something called the new defaults summary. In DB2, every parameter has a default value. It is very common for a given user to keep the default value for particular parameters. For various reasons, when a new version of DB2 comes out, the default values might change. So, the complete list of DB2 parameters is examined to determine all the parameters whose default values have changed in the new version of DB2. Then, these parameters, whose default values have changed, are examined to determine those of the parameters where, in Version 4 of DB2, the user accepted the default value of the parameters.

If the user did not select the default value in Version 4, he/she is not likely to be interested in what the default value is in Version 5. The user apparently had a reason to change from the default value and as a consequence must know about the parameter. There is no need to worry about the user in such a situation. If, however, the user had accepted the default value of a parameter in Version 4, it is desirable to inform the user that the default has changed by listing the parameters in the new defaults summary, and give the user an opportunity to change the default value.

The new defaults summary TaskGuide window shown in FIG. **14**, another example of which is shown in FIG. **15**, provides to the user a list of all the parameters whose default values have changed, where the user had accepted the default values in Version 4. For each of these parameters, this window also provides to the user information regarding the Version 4 default value, the Version 5 default value and the current value. The user may change the value of the parameter from the default value by changing the current value field in the window.

Returning once again to FIG. **8**, which shows the "Choice window," the expert path will now be discussed. This path is taken by a user who is familiar with all of the new functions and parameters of the new version of DB2 and need not be stepped through the TaskGuide to learn of the new functions and parameters. When this path is selected, the user is presented with the Expert window, which is shown in FIG. **16**. This expert window presents the user with a list of buttons representing all the predefined install windows that the user would have eventually accessed had he/she gone through the TaskGuide.

For example, if the user were to select the button marked "Sysplex query parallelism", he/she would be presented with the window shown in FIG. **17**, the same window as shown in FIG. **10**, where both Figures show the fields to be filled out by the user. The difference in FIG. **17** is that there is also a button labeled TaskGuide, which was not visible in FIG. **10**. This TaskGuide button allows the expert user to access the TaskGuide in case the information available there is needed.

In summary, the user has the option of choosing one of two paths, the TaskGuide path or the expert path. If the user chooses to go through the TaskGuide, he/she is given information about all the new functions and parameters. If the function or parameter is changeable, the user is given the opportunity to leave the Task Guide, go to an predefined install window, set parameters, return to the Task Guide and continue. If the user chooses to go to the expert path, the user is given a list of all the predefined install windows that may be accessed. The user can then jump to every one of those predefined install windows that he would have been able to access by using the TaskGuide, including the new defaults window.

In the present invention, the TaskGuide gives the user information about all the new functions and parameters, while utilizing all the separate predefined install windows. The same can be said for the expert path, where the user can leave the Expert window and jump to any of the predefined install windows. This provides the user with the ability to find out about all the functions of the product, without having all of the parameters in two different places, in the TaskGuide windows of the TaskGuide and in the predefined install windows.

In prior systems, which have some sort of informational user guide, designers of such systems having, on the order of 100 different functions and parameters, have decided that the typical user will not care about 90% of them. The designers then take the remaining 10 parameters and create an informational guide with them, where the user can change the 10 parameters directly in the guide. In other words, the parameter windows are thrown into the path of the informational guide and the user is asked about and is allowed to set only those 10 parameters which the designers have deemed as the most significant. Thus, prior systems have not allowed the user to access all the parameters and have also not allowed the user to leave the informational guide and go

to an already predefined window to access the parameters which also has help and intelligence built in.

Thus, the present invention provides a way in which system parameters may be set, either by an expert user or by a non-expert user.

Returning to FIG. 4, once the user has completed the "Set up version 5 new function" step, that button is presented with the highlighted border in the manner discussed above. The user may then press the "Modify Migration Options" button, which will cause the window shown in FIG. 19 to be shown to the user. FIG. 19 lists DB2 Installer options along with an icon next to each of the options. The pencil icon indicates that the option is read-write, or modifiable, whereas, the pencil with an "x" icon indicates that the option is read only.

When the user clicks on the Done button of FIG. 19, the user is returned to the window of FIG. 4, where the user may click on the "Test DB2 system health" button. If the user chooses to do so, the user is presented with a standard job card (not shown), which the user fills out. After this is done, the user is then presented with the window shown in FIG. 18. FIG. 18 shows a standard job status window, entitled "Health Check Job Status," which contains jobs and information points, such as "Check integrity". The reason for running this health check is that before a user migrates his/her DB2 system, or any other database system, it is wise to check on the health or status of the running DB2 catalog and directory to ensure consistency and a lack of conflicts. It is also wise to know of any changes in the product that could possibly affect any currently running applications. Such information is also apparent from the job status window. DB2 Installer has provided a path within migration, which allows the user to verify the integrity of his/her database catalog and directory. In the Health Check View, shown in FIG. 18, the user is presented with a predefined job, which can be divided into smaller jobs. From here the user can edit the jobs, including the job control language (JCL), execute the jobs, or add jobs. A shadow of the DB2 catalog and directory is created and the predefined and edited jobs are run against it to verify the integrity of the database catalog and directory. Any additional jobs added by the user are also executed to verify the integrity of the catalog and directory. This verification controls contention problems on the user's production catalog. DB2 Installer has taken many of the manual steps out for the user and provided a GUI path for the execution of these jobs. Another key component is the help that users receive via the Info Points on the Health Check View, where the Info Points list a series of tasks which the user needs to perform on his/her own. FIG. 21 shows an example of one such Info Point. These contain information and tasks that the user should perform and for which the DB2 Installer is unable to provide a job. While the user should make use of these jobs prior to a migration, most users will find the queries useful after migration as well, and will now have a convenient way to access and execute them.

After completion of the system health test, the user is returned to the window shown in FIG. 4, where the user can click on the button labeled "Generate migration jobs." After jobs are successfully generated, the "Run migration jobs" button, shown in FIG. 4, is enabled. Once the user clicks on this button, the user is presented with a window (not shown) where the user fills out job card information and clicks Continue. The user is then presented with the window shown in FIG. 20 which provides job status. Further details regarding running jobs were discussed above.

Once the migration jobs have been run, the user may verify his/her system by clicking on the "Run version 4 sample jobs" and "Run version 5 sample jobs" buttons, shown in FIG. 4. Once these steps are done, migration is complete.

As noted above, the foregoing discussion has been presented in the context of a migration task. It is to be noted this discussion applies correspondingly to a user who wishes to perform a load SMPE libraries, install, fallback, remigrate or update task or any other similar tasks. For example, a user performing a fallback task may obtain job status through the continuous polling procedure discussed above. Similarly the fallback user can determine which steps of a task have been completed, can check the integrity of the database system and view the defaults list, all as discussed above.

In addition, DB2 Installer has applied the same GUI concepts, as discussed above, towards the loading of SMPE libraries or other similar preinstall functions. The approach, views, flow and job status indicators are implemented in the same fashion as the rest of DB2 Installer. In prior systems, users were instructed to unload jobs from the tape or cartridge, and edit them manually. The GUI in accordance with the present invention, enables the user to supply input for parameters that is edited into preinstall jobs. Progress and execution of these jobs is handled in the same way as jobs for install, migrate, etc. are handled for a program such as DB2. While the implementation of this in DB2 Installer is specific to DB2, the GUI can be used to accommodate other programs requiring preinstall functions.

Other modifications and variations to the invention will be apparent to those skilled in the art from the foregoing disclosure and teachings. Thus, while only certain embodiments of the invention have been specifically described herein, it will be apparent that numerous modifications may be made thereto without departing from the spirit and scope of the invention.

What is claimed is:

1. A method for verifying integrity of a catalog and directory of a program on a computer system, the system including a workstation and a host, the catalog and directory of the program being disposed on the host, the workstation including a display, the method comprising the steps of:

a) displaying a map of at least one job on the display;

b) providing a user of the workstation with an ability to select and edit the job and add additional jobs, each of the jobs being executed on the host and comprising queries for verifying integrity of a different aspect of the catalog and directory;

c) creating a shadow of the catalog and directory; and

d) executing the at least one job against the shadow of the catalog and directory and executing any additional jobs added by the user for verifying the integrity of the catalog and directory.

2. The method according to claim 1, wherein steps a) through d) are performed prior to migrating from a first version of the program to a second version of the program.

3. The method according to claim 1, wherein the program is DB2™.

4. The method according to claim 1, wherein the at least one job and any additional jobs are executed during one of install, migrate, fallback, remigrate and update program procedures.

5. The method according to claim 1, wherein in the step a) the map is displayed on the display in a graphical form using a graphical user interface.

6. A computer system for verifying integrity of a catalog and directory, the system comprising:

a workstation including a display;

a host, the catalog and directory being disposed on the host; and

a program providing on the display a map of at least one job, wherein a user of the workstation may select and edit the job and add additional jobs, each of the jobs being executed on the host and comprising queries for verifying integrity of a different aspect of the catalog and directory; wherein in response to the user selecting, editing and adding jobs, a shadow of the catalog and directory are created and wherein in response to the creating of the shadow of the catalog and directory, the at least one job is executed against the shadow of the catalog and directory and any additional jobs are executed for verifying the integrity of the catalog and directory.

7. The computer system according to claim 6, wherein the verifying integrity of the database catalog and directory is performed prior to migrating from a first version of the program to a second version of the program.

8. The computer system according to claim 6, wherein the program is DB2™.

9. The computer system according to claim 6, wherein the at least one job and any additional jobs are executed during one of install, migrate, fallback, remigrate and update program procedures.

10. The computer system according to claim 6, wherein the map is displayed on the display in a graphical form using a graphical user interface.

11. A computer program to be performed on or with the aid of a computer system for verifying integrity of a catalog and directory of a program on a computer system, the system including a workstation and a host, the workstation including a display, the catalog and directory of the program being disposed on the host, the computer program comprising the steps of:

a) displaying a map of at least one job on the display;

b) providing a user of the workstation with an ability to select and edit the job and add additional jobs, each of the jobs being executed on the host and comprising queries for verifying integrity of a different aspect of the catalog and directory;

c) creating a shadow of the catalog and directory; and

d) executing the at least one job against the shadow of the catalog and directory and executing any additional jobs added by the user for verifying the integrity of the catalog and directory.

12. The computer program according to claim 11, wherein steps a) through d) are performed prior to migrating from a first version of the program to a second version of the program.

13. The computer program according to claim 11, wherein the program is DB2™.

14. The computer program according to claim 11, wherein the at least one job and any additional jobs are executed during one of install, migrate, fallback, remigrate and update program procedures.

15. The computer program according to claim 11, wherein in said step a) of said computer program the map is displayed on the display in a graphical form using a graphical user interface.

16. A computer-readable medium containing a computer program for performing the method of verifying integrity of a catalog and directory of a program on a computer system, the system including a workstation and a host, the catalog and directory of the program being disposed on the host, the workstation including a display, the computer program comprising the steps of:

a) displaying a map of at least one job on the display;

b) providing a user of the workstation with an ability to select and edit the job and add additional jobs, each of the jobs being executed on the host and comprising queries for verifying integrity of a different aspect of the catalog and directory;

c) creating a shadow of the catalog and directory; and

d) executing the at least one job against the shadow of the catalog and directory and executing any additional jobs added by the user for verifying the integrity of the catalog and directory.

17. The computer-readable medium according to claim 16, wherein steps a) through d) are performed prior to migrating from a first version of the program to a second version of the program.

18. The computer-readable medium according to claim 16, wherein the program is DB2™.

19. The computer-readable medium according to claim 16, wherein the at least one job and any additional jobs are executed during one of install, migrate, fallback, remigrate and update program procedure.

20. The computer-readable medium according to claim 16, wherein in said step a) of said computer program the map is displayed on the display in a graphical form using a graphical user interface.

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[54] **GRAPHICAL MENU FOR A TELEVISION RECEIVER**

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[51] **Int. Cl.**[6] **H04N 5/262**; H04N 5/445

[52] **U.S. Cl.** **348/589**; 348/600; 348/564; 348/565

[58] **Field of Search** ..... 348/564, 565, 348/569, 584, 589, 600; 358/183, 22, 22 PIP; 345/115, 116, 146, 902; H04N 5/445, 5/45, 5/262, 5/278

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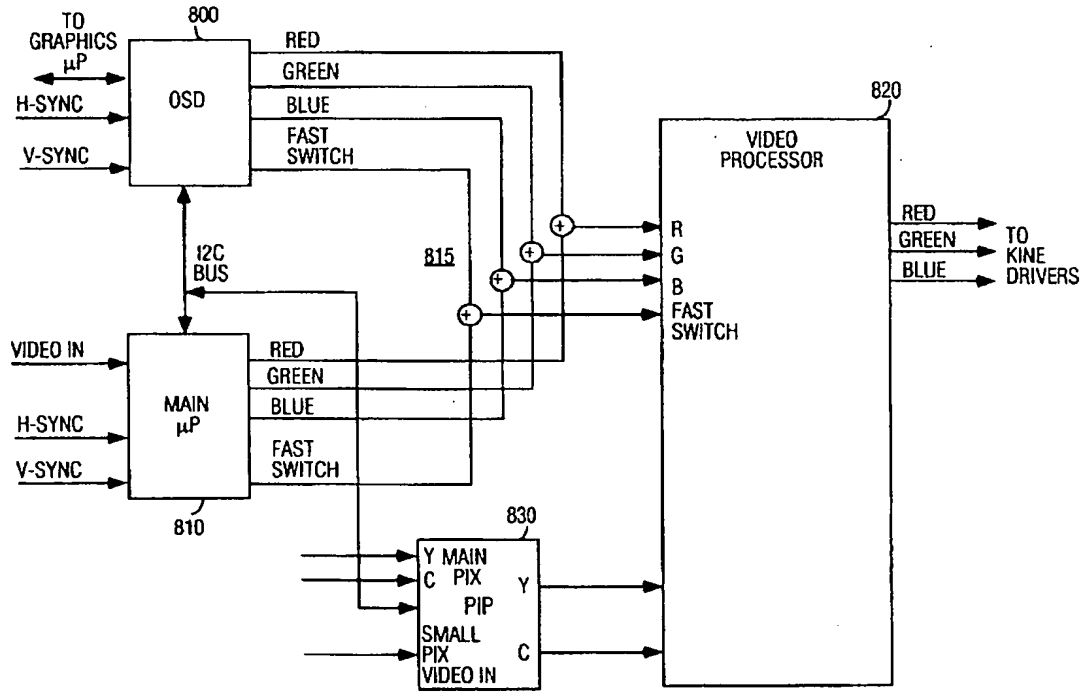
Primary Examiner—Victor R. Kostak
Assistant Examiner—Sherrie Hsia
Attorney, Agent, or Firm—Joseph S. Tripoli; Peter M. Emanuel; Thomas F. Lenihan

[57] **ABSTRACT**

A television receiver, includes a graphics generator for generating for display a stylized image of the environment in which the user's physical television receiver is situated. The image includes graphical representations of functions which are available for selection and control by a user, and at least one of which functions affect the display of the video image. In one embodiment of the invention, a video inset-image from a PIP unit is completely surrounded by a graphics image. The PIP image is aligned with the screen of a graphically displayed television receiver to portray an image of a television displaying an received television program. Alternatively, an animated graphics presentation is displayed in the screen area of the graphically-displayed television receiver to simulate live video. In another embodiment, a stylized display of the user's room is altered in response to user input regarding the user's consumer electronics equipment, and submenu operational choices are enabled or disabled accordingly.

4 Claims, 9 Drawing Sheets



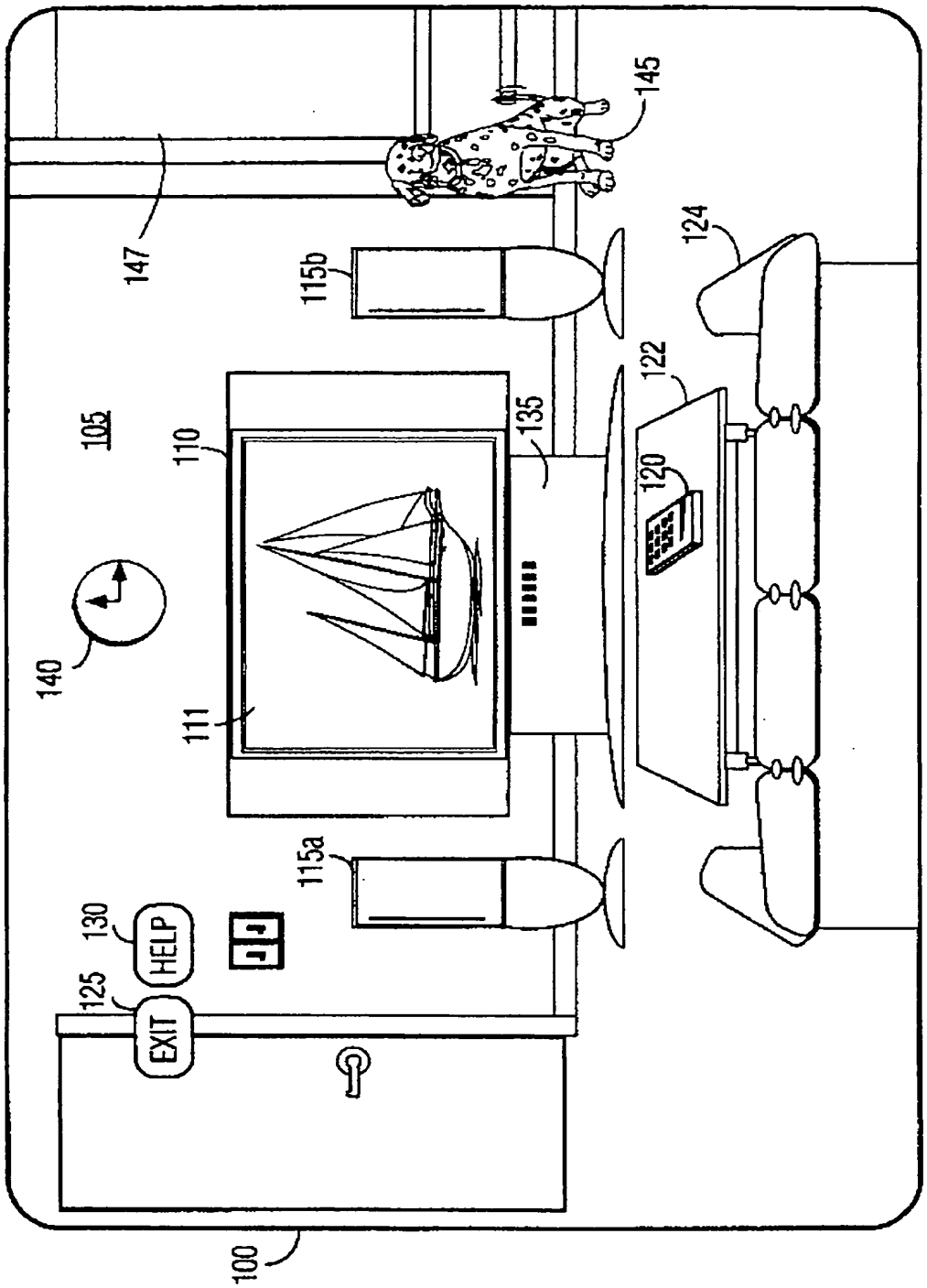

145
147
115b
124
122
105
110
135
120
140
111
115a
130
HELP
125
EXIT
100

FIG. 1

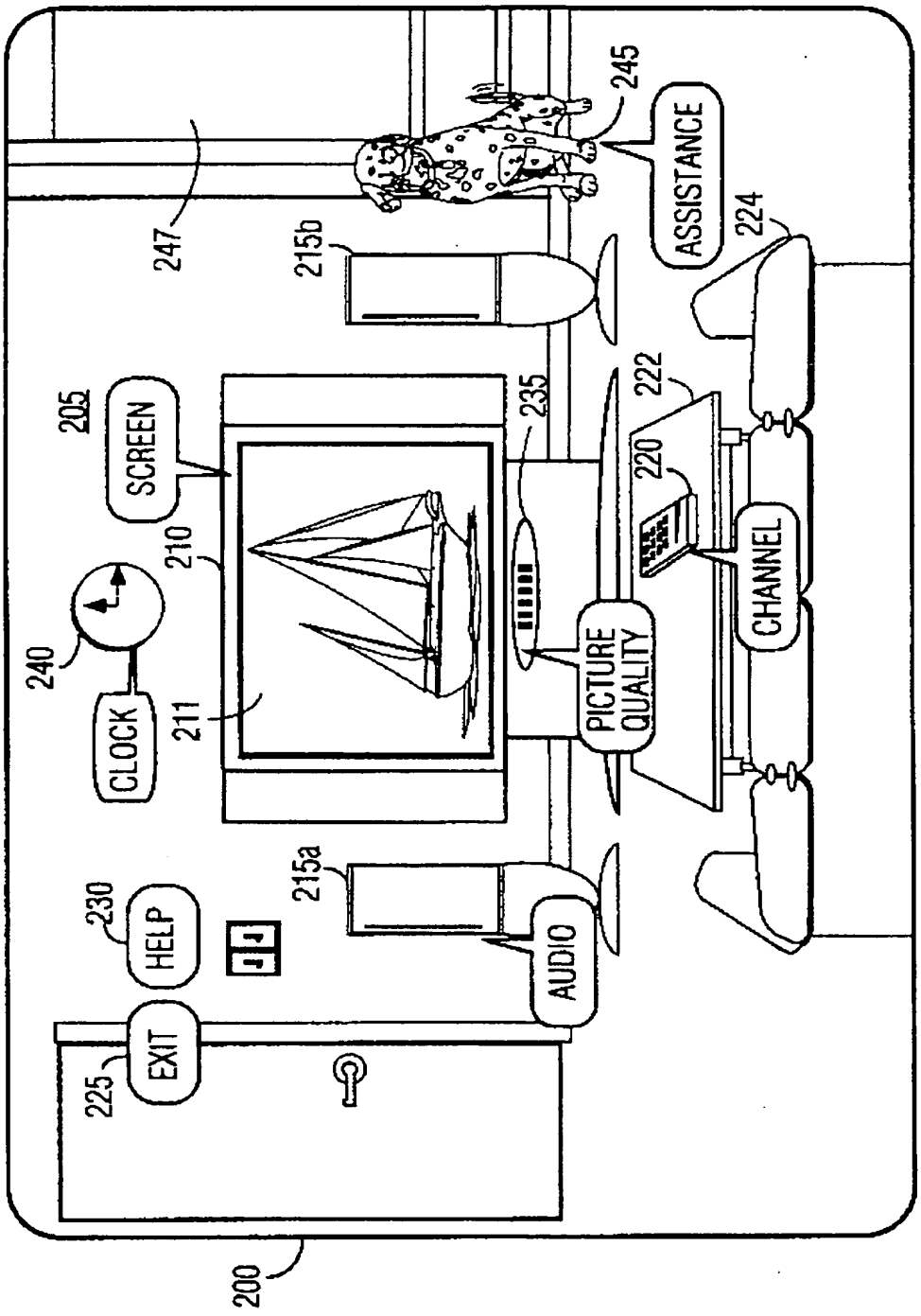

247
245
ASSISTANCE
224
215b
205
SCREEN
235
222
220
210
240
CLOCK
211
PICTURE QUALITY
CHANNEL
215a
230
HELP
AUDIO
EXIT
225
200

FIG. 2

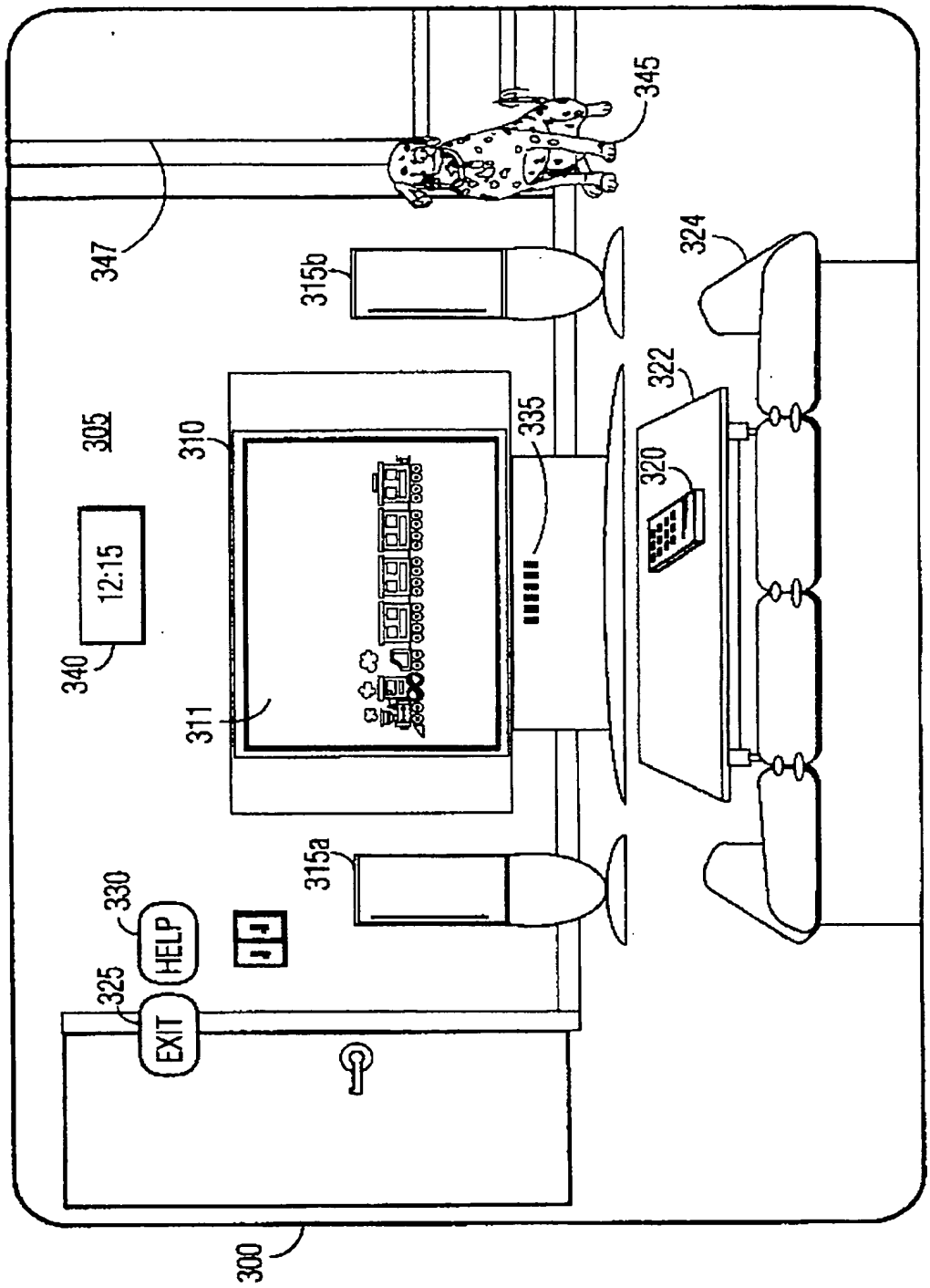

345
347
315b
324
322
335
305
310
320
12:15
340
311
315a
330
HELP
325
EXIT
300

FIG. 3

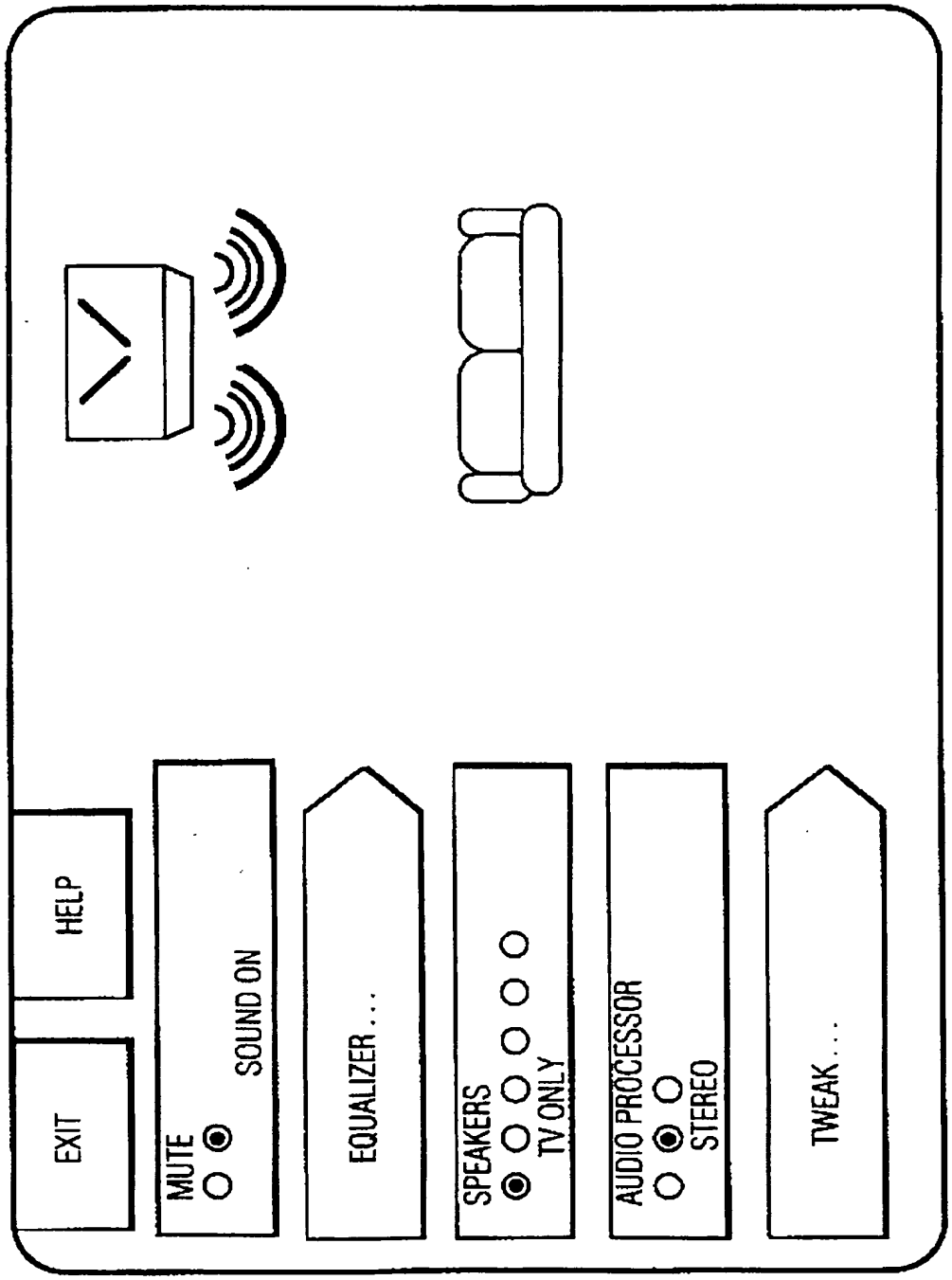

EXIT
HELP
MUTE
SOUND ON
EQUALIZER....
SPEAKERS
TV ONLY
AUDIO PROCESSOR
STEREO
TWEAK....

FIG. 4

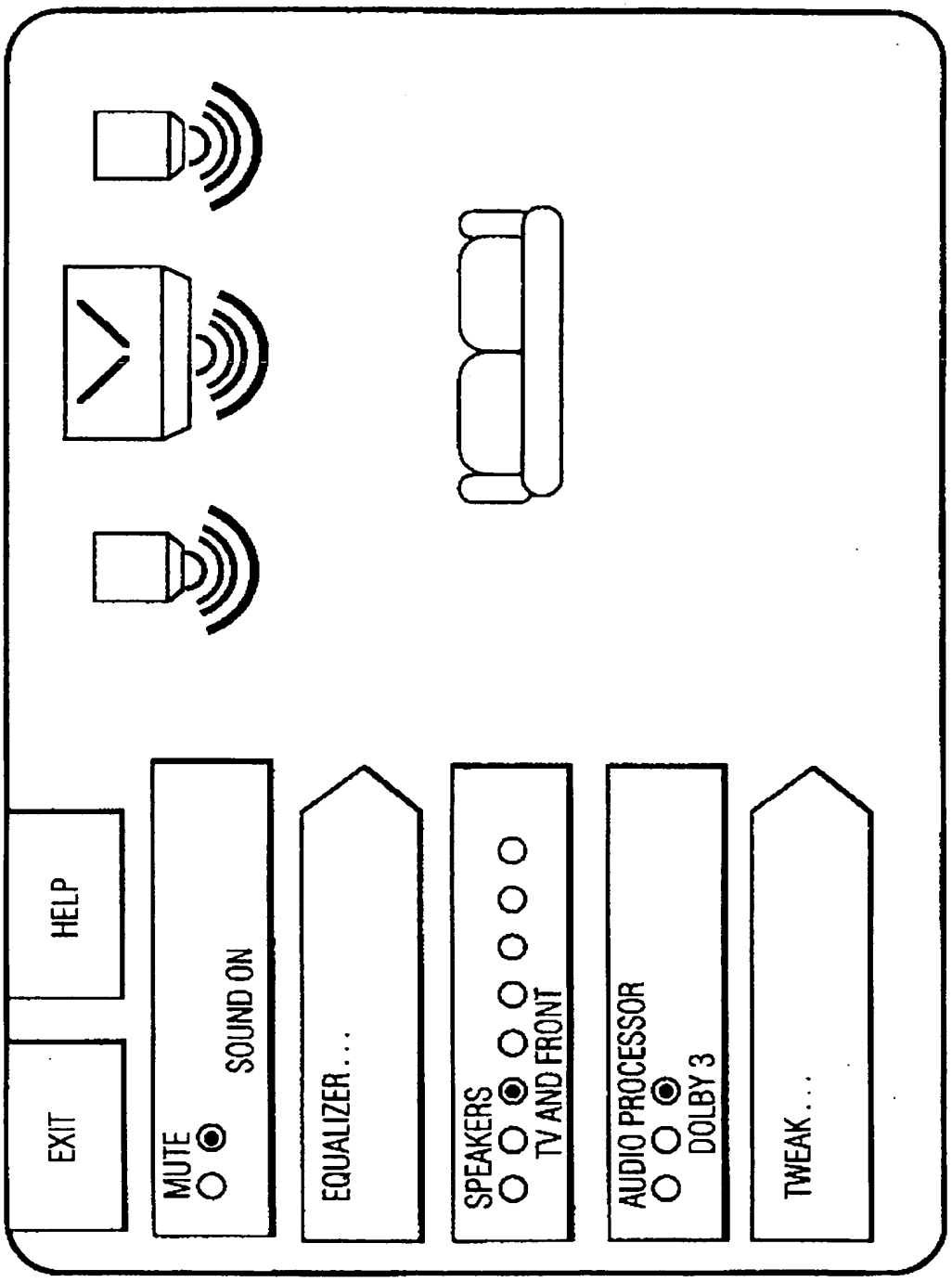

EXIT
HELP
MUTE
SOUND ON
EQUALIZER...
SPEAKERS
TV AND FRONT
AUDIO PROCESSOR
DOLBY 3
TWEAK...

FIG. 5

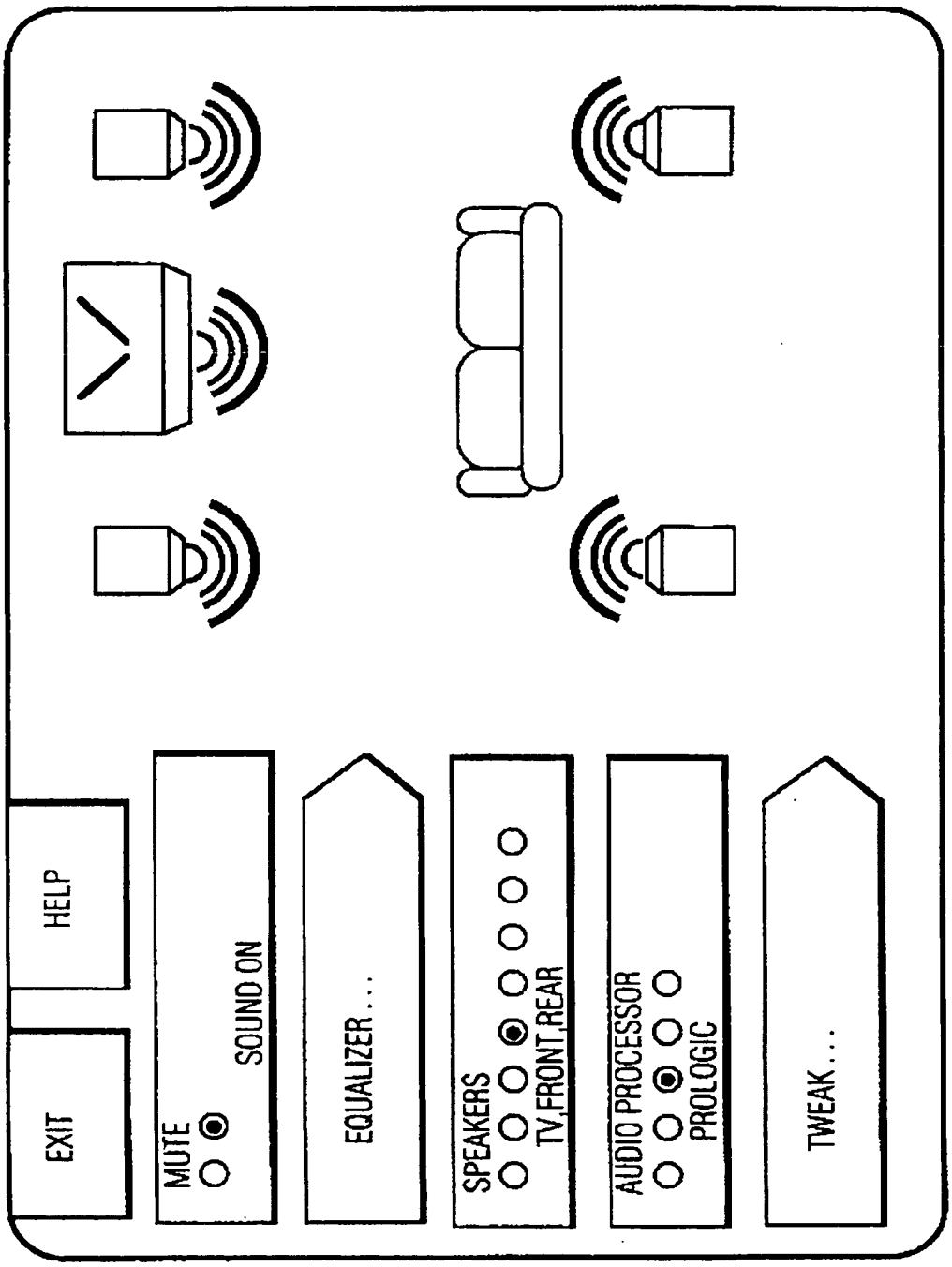

EXIT
HELP
MUTE
SOUND ON
EQUALIZER...
SPEAKERS
TV,FRONT,REAR
AUDIO PROCESSOR
PROLOGIC
TWEAK...

FIG. 6

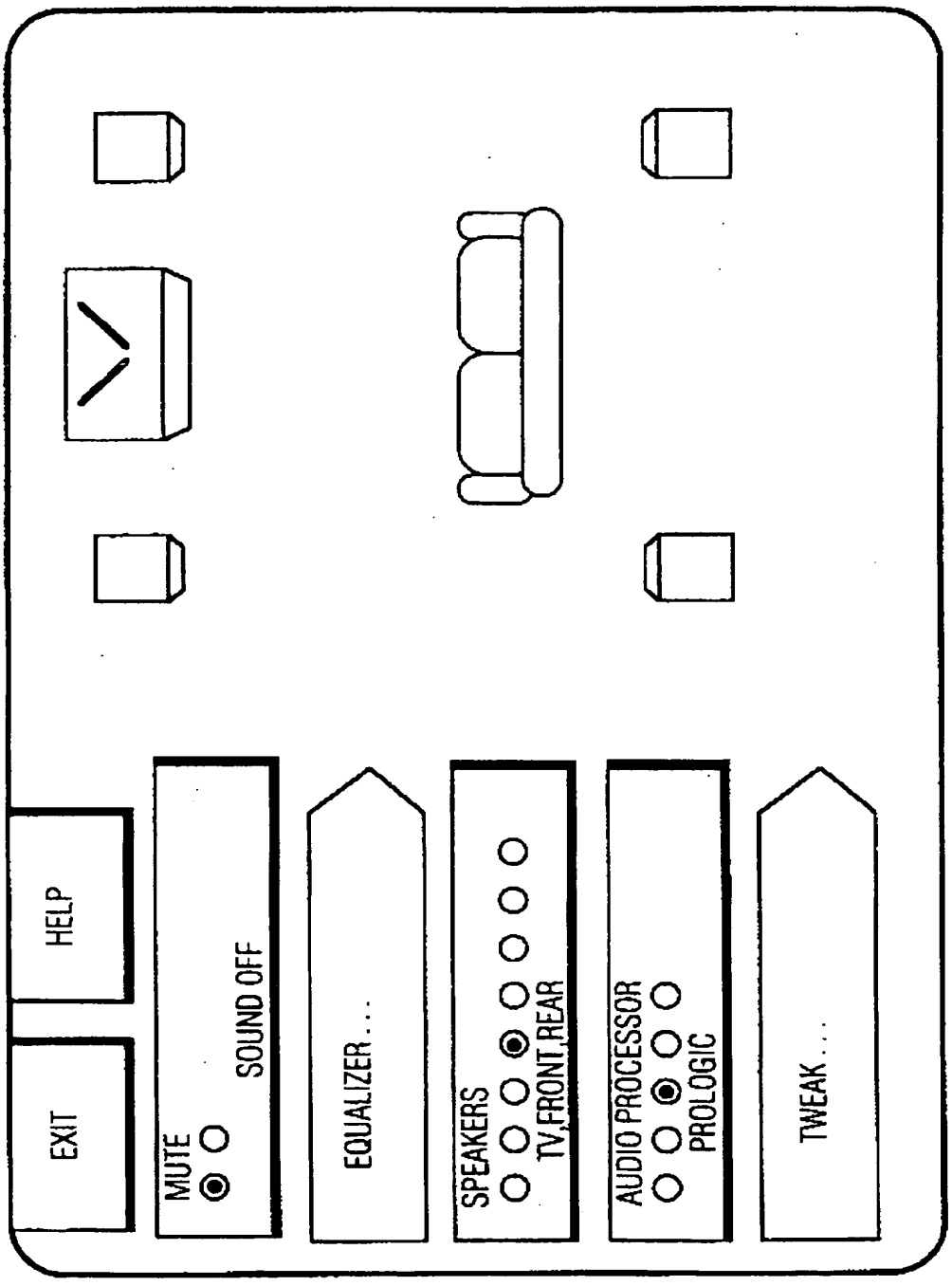

EXIT
HELP
MUTE
SOUND OFF
EQUALIZER...
SPEAKERS
TV,FRONT,REAR
AUDIO PROCESSOR
PROLOGIC
TWEAK...

FIG. 7

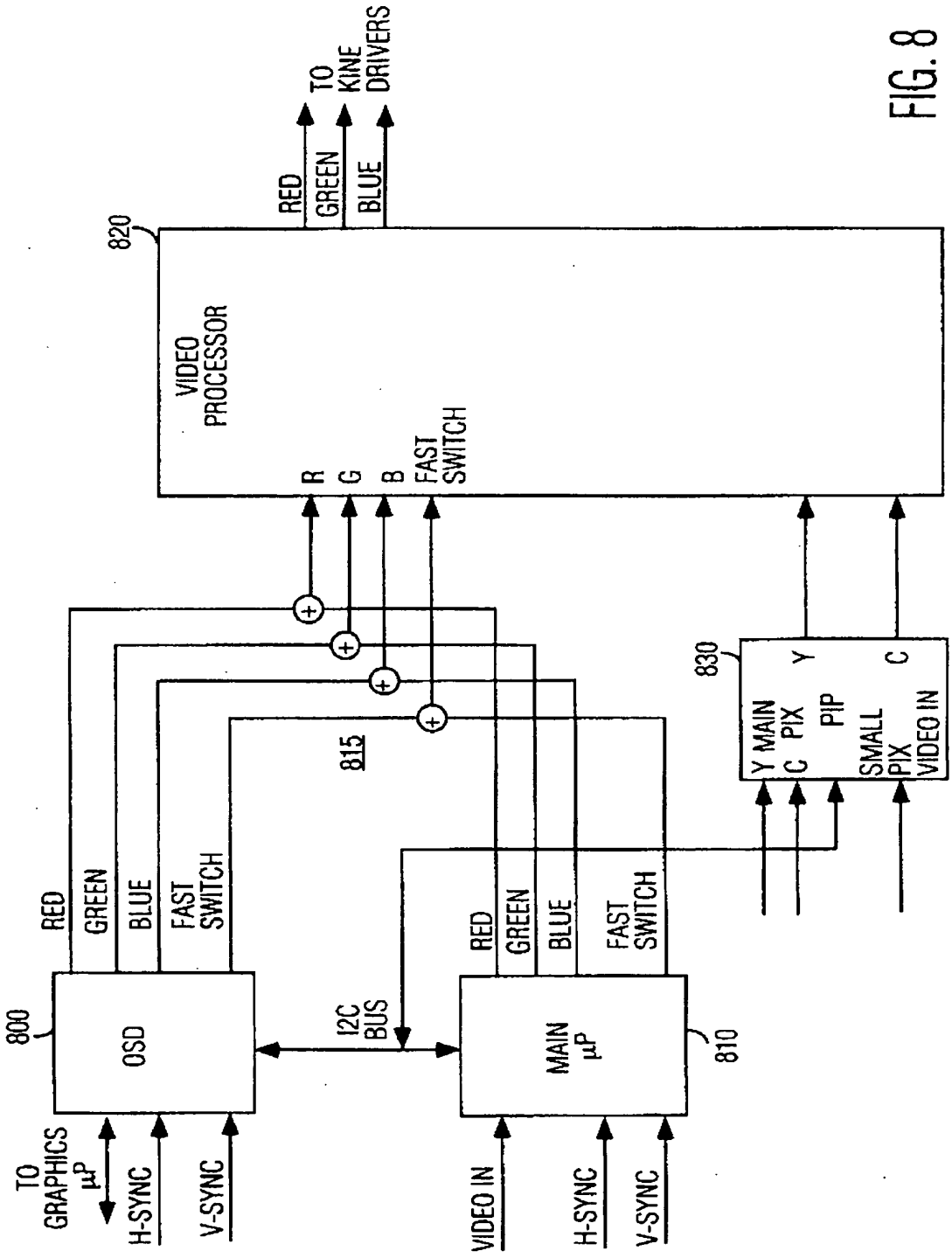

TO KINE DRIVERS
RED
GREEN
BLUE
820
VIDEO PROCESSOR
R
G
B
FAST SWITCH
815
830
Y MAIN
C PIX
Y
PIP
C
SMALL PIX VIDEO IN
RED
GREEN
BLUE
FAST SWITCH
800
OSD
I2C BUS
MAIN μP
810
TO GRAPHICS μP
H-SYNC
V-SYNC
VIDEO IN
H-SYNC
V-SYNC

FIG. 8

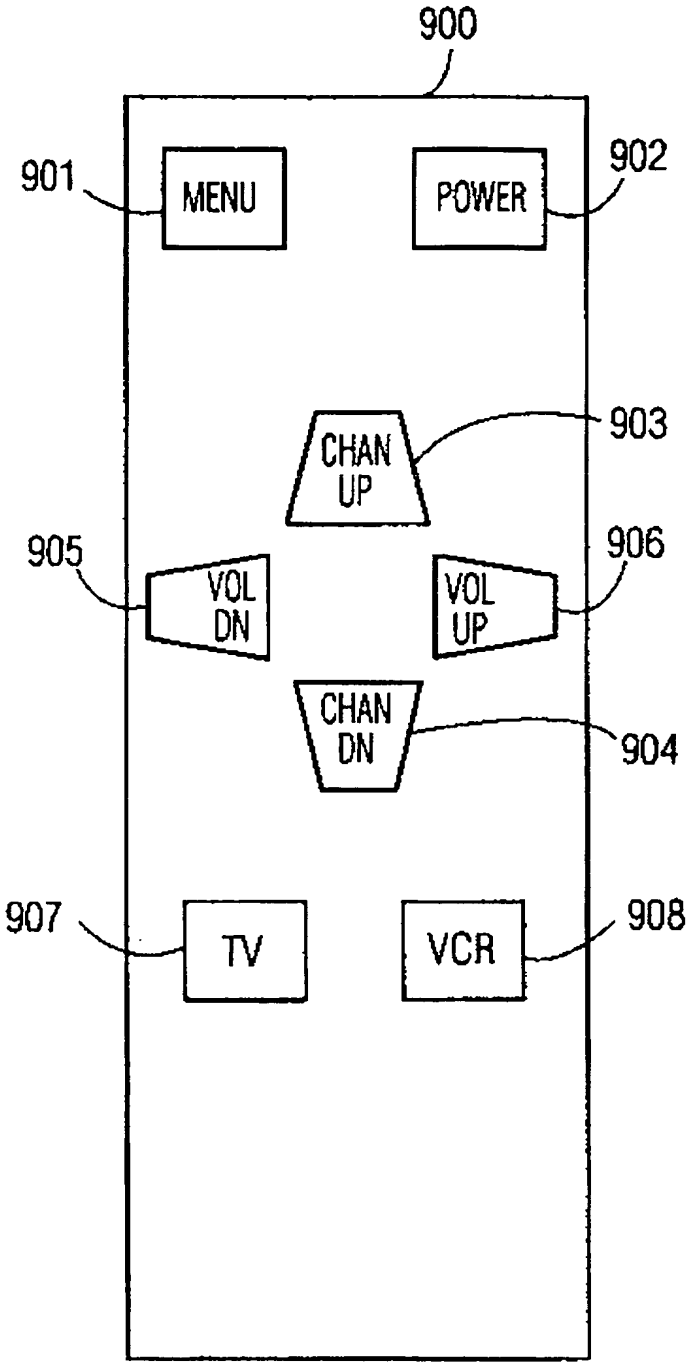

900
901
MENU
POWER
902
CHAN UP
903
905
VOL DN
VOL UP
906
CHAN DN
904
907
TV
VCR
908

FIG. 9

GRAPHICAL MENU FOR A TELEVISION RECEIVER

This is a continuation of U.S. patent application Ser. No. 08/328,654 filed Oct. 25, 1994, abandoned.

FIELD OF THE INVENTION

The subject invention generally concerns menu generation circuitry for electronics equipment, such as, television receivers, and specifically relates to a novel "graphical menu".

BACKGROUND OF THE INVENTION

Control of modern television receivers has become increasingly complicated in recent years, as more and more user-controllable features have been implemented by manufacturers in television receivers of ever-greater complexity. For example, in addition to the normal television receiver controls, some user-controllable features which were unheard-of just a few years ago are now commonly available to consumers, such as, COLOR TEMPERATURE, VIDEO NOISE REDUCTION, SURROUND SOUND, and SLEEP TIMER, just to name a few.

In an attempt to present an orderly array of these controllable functions, manufacturers introduced the concept of function control menus. In such well-known schemes, a menu is called up to the screen, and a particular function to be controlled, such as COLOR, is selected by the viewer for adjustment. Unfortunately, the menus soon grew too long for convenient screen display, and were expanded to include sub-menus allowing selection of related items. For example, selecting the menu item entitled VIDEO brings up yet another menu listing such related items as, BRIGHTNESS, CONTRAST, COLOR, TINT, SHARPNESS, COLOR TEMPERATURE, and VIDEO NOISE REDUCTION. While such an arrangement may seem straight-forward to a computer programmer, it may be extremely confusing, and even intimidating, to the average nontechnical user, who was quite happy to adjust the brightness of his receiver by turning a knob on the front panel, without having to wade through a mire of menus and submenus to accomplish that simple task. It is important to note that unlike the main menus found on today's receivers, the array of knobs on the front panels of yesterday's receivers formed an intuitive object-oriented guide which naturally, and in a nonconfusing fashion, led the viewer to the correct control for accomplishing his task.

SUMMARY OF THE INVENTION

In a first embodiment of the invention, a menu generation arrangement for use in a television receiver, includes a graphics generator for generating for display a stylized image of the environment in which the user's physical television receiver is situated. The image includes graphical representations of functions which are available for selection and control by a user, and at least some of which functions affect the display of the video image.

In a second embodiment of the invention, a menu generator for use in a television receiver, comprises a graphics generator for generating a graphics signal for display, a video processor for processing a video signal, and picture-in-picture processor coupled to the video processor. The picture-in-picture processor derives a signal from the video signal for use as the secondary image portion. The video processor produces a combined signal which when displayed comprises a video image completely surrounded by a graphics image. The graphics image includes graphical representations of functions to be controlled, which are selectable for control by a user, and at least some of the selectable functions affect the display of the video image. In this embodiment of the invention, the PIP processor displays the PIP image in a screen location in which it is aligned with the screen of a graphically displayed television receiver to portray an image of a television displaying an actual received television program.

In yet another embodiment of the invention, an animated graphics presentation is displayed in the screen area of the graphically-displayed television receiver to simulate live video to further enhance the perception of the displayed image as representation of the user's own environment.

In yet another embodiment of the invention the stylized display of the user's room is altered in response to user input regarding the user's consumer electronics equipment. In this embodiment, submenu operational choices are enabled or disabled depending upon the user's input as to which pieces of equipment are connected to the system.

BRIEF DESCRIPTION OF THE DRAWING

FIGS. **1** and **2** show a screen display comprising a graphical menu which includes a depiction of a room having a television receiver displaying active video.

FIG. **3** shows a screen display comprising a graphical menu, which includes depiction of a room having a television receiver displaying animated graphics to simulate reception of a television program.

FIGS. **4–7** show an graphical audio submenu comprising a plan view of the room of FIGS. **1–3** which includes a depiction of the number of audio components specified by the user.

FIG. **8** shows, in block diagram form, the relevant portion of the circuitry of a television receiver operating in accordance with the invention.

FIG. **9** is a simplified drawing of a remote control unit suitable for use with the invention.

DETAILED DESCRIPTION OF THE DRAWING

Referring to FIG. **1**, graphical menu, generally designated **105**, is displayed on a screen **100** of a television receiver. Graphical menu **105** is a simplified view of a room which is understood to be the viewer's own family room (or living room), and to convey this understanding, the room includes features commonly found in a family room, such as, a television receiver **110**, a pair of speakers **115***a* and **115***b*, a coffee table **122**, a couch **124**, a wall clock **140**, and even the family dog **145**. It is intended that the viewer feel comfortable with the scene, so to further enhance the viewer's sense of familiarity with the scene, a remote control unit **120** is shown placed on the coffee table, and an actual television image, derived from a PIP (i.e., picture-in-picture) processor appears to be displayed on the screen **111** of virtual television receiver **110**. A depiction of the daytime sky is seen outside a virtual window **147** during daylight hours, and the nighttime sky is seen during the evening. Also shown are two "buttons" **125** and **130**, labelled EXIT AND HELP, respectively, the functions of which will be described below.

The scene described above is not merely a graphics display, but rather is a main menu of control functions presented in what is believed to be an unintimidating, non-threatening, object-oriented fashion. Simple access to

this graphical menu is gained by pressing MENU key **901** on a remote control unit **900** of FIG. **9**. During the time that the graphical menu is displayed, CHAN UP, CHAN DN, VOL UP, and VOL DN keys **903**, **904**, **905**, and **906** are no longer used to change channels or for volume control, but rather are used as X and Y-direction cursor control keys for use by the viewer to "navigate" through the graphical menu, as described below.

FIG. **2** is almost identical to FIG. **1**, with the exceptions that each of the selectable objects is shown surrounded by graphical highlighting, and each has a "balloon label" displayed near it. In reality, only one of the selectable items will be highlighted and labelled at a time, as cursor keys **903–906** are operated. The functions of each of the selectable objects of the main menu will now be described.

A user operates cursor keys **903–906** to highlight for example, display screen **211** of television receiver **210**, and then presses MENU key **901** to accomplish the selection of that particular submenu. A SCREEN submenu is displayed which provides for the selection of SINGLE SCREEN, PIX-IN-PIX (PIP), SPLIT SCREEN, PIX-OUTSIDE OF-PIX (POP), and CHANNEL GUIDE. CLOSED CAPTIONING display options are also provided in the screen submenu.

Selecting the PICTURE QUALITY submenu by highlighting the control panel **235** of television receiver **210**, causes the display of a graphical submenu which comprises "sliding adjustment bars" for the adjustment of CONTRAST, COLOR, TINT, BLACK LEVEL, and SHARPNESS. In addition one may enable, disable, or adjust the levels of COLOR WARMTH, VIDEO NOISE FILTER, AUTO COLOR, and a feature known as THEATER.

Clock **240** can be selected in the same fashion, and its submenu allows for the selection of time-related functions, such as TIME OF DAY, SLEEP FUNCTION AUTO TURN OFF.

Selecting the remote control unit **220**, brings up the CHANNEL submenu which contains channel-related commands, such as PARENTAL CONTROL of a particular channel, selection of signal source (e.g., ANTENNA A), signal type (CABLE), and AUTO CHANNEL SEARCH. When PARENTAL CONTROL is ON, only channels listed in the parent approved list will be accessible via the front panel. Thus, parents can lock out certain channels by taking the remote control unit with them.

Selecting Man's Best Friend, the dog **245**, causes the system controller to display an array of ASSISTANCE submenu choices, such as SETUP, CONNECTIONS, PREFERENCES, and ABOUT YOUR TV. SETUP is a step by step routine to aid the user in installing his television receiver. CONNECTIONS is an interactive display which aids the user in connecting various external equipment (such as a VCR) to his receiver by actually presenting a drawing of the rear connection panels of both the TV and the VCR, and showing the user where each connection should be made. PREFERENCES allows the selection of a TEXT MAIN MENU or the FAMILY ROOM graphical Menu, the color of the graphics of the family room display, and a clock style choice of an analog time display as shown in FIGS. **1** and **2**, or a digital time display as shown in FIG. **3**.

Selecting the HELP button causes a display of detailed instructions. Selecting EXIT causes a return to the last channel watched. Selecting ABOUT YOUR TV allows a choice of a self-paced tour of the television system, or an interactive remote control help function.

It was noted above that the PIP unit of the actual receiver is used to display a PIP image in the screen area **211** of virtual television receiver **210**. The sailboat of FIG. **1** and **2** is intended to convey the idea of active video being displayed by the PIP processor. With respect to FIG. **3**, the cartoon-like train on screen **311** of receiver **310** is intended to convey the idea that the FAMILY ROOM format for a graphical menu is useful even in a television receiver which does not have PIP capability, by using the graphics OSD chip to draw an animated figure in the screen area of the virtual TV.

Selecting the AUDIO submenu by highlighting speakers **215***a*, **215***b* and pressing MENU key **901**, causes the displays shown in FIGS. **4–7**. FIGS. **4–7** are simplified, generic plan views (i.e., overhead views) of the user's family room showing different speaker configurations. Each speaker configuration is a representation of the actual equipment which the user possesses, based on data entered by the user in response to the various options presented on the left side of the figure. FIG. **4** shows no external speakers, FIG. **5** shows two external speakers, and FIG. **6** shows four external speakers. Note that the number of selectable audio options increases with the number of external speakers. Dolby **3** (which uses, left, right, and front speakers) is an available choice for the configuration of FIG. **5**, but is not available for the configuration of FIG. **4**. SURROUND SOUND (which uses front and rear speakers) is not a selectable feature for the configuration shown in FIGS. **4** or **5**, but is available for the configuration of FIG. **6**. That is, if the system, as configured, cannot support a particular audio processing function, choice of that function is not presented to the viewer. FIG. **7** shows the screen display of FIG. **6** after a user has selected the MUTE option. Note that the sound waves **650–658** are absent from FIG. **7** to illustrate lack of audio output. It is envisioned that differently-colored and differently-sized sound waves can be used to illustrate relative balance during balance adjustment. Other audio menu items include a graphical illustration of an equalizer.

FIG. **8** shows a simplified block diagram of that section of the receiver which provides the above-described screen displays. OSD (On Screen Display) Processor **800** is preferably a bit-mapped graphics generator for masking the majority of the display screen with graphics, under control of a Main Microprocessor **810**. OSD Processor **800** produces image signals at Red, Green, and Blue color signal output terminals. Main Microprocessor **810** also receives a video signal from the television chassis and derives closed caption information therefrom. It produces closed caption display signals at Red, Green, and Blue color signal output terminals. The outputs of OSD Processor **800** and of Main Microprocessor **810** are summed together in an array of summing circuits, generally designated **815**. These summing circuits may comprise, for example, the well-known non-additive mixer circuit, which has the property that it will pass the greater of the two signals at its inputs while blocking the lesser of the two input signals. The outputs of the summing circuits are applied to a VIDEO PROCESSOR unit **820** which also receives Y (luminance) and C (chrominance) component video signals from a PIP unit **830**. The input signals for PIP unit **830** are provided by television chassis components which are conventional in nature, and are not shown. A FAST SWITCH signal generated by either OSD Processor **800** or Main Microprocessor **810** causes the graphics signal (or closed caption signal) to be substituted for the video signal for the duration of the fast switching signal.

Main Microprocessor (i.e., system controller) **810** operating under control of its own software causes PIP unit **830** to automatically display a PIP image at the exact location of

the screen display of the virtual television drawn by OSD processor **800** to complete the illusion of a family room having an operating television receiver. In the case of FIG. **3**, the displayed position of the animated cartoon image of the train is updated every television field to create the illusion of motion across the screen **311** of virtual TV **310**.

The phrases "system controller" and main microprocessor are used interchangeably herein and are intended to also encompass microcomputers and dedicated custom integrated circuits. The term "television receiver" is intended to encompass television receivers having a display device (commonly called TV sets) and television receivers not having a display device (such as VCRs).

What is claimed is:

1. Menu generation apparatus for use in a television receiver, comprising:

graphics generation means for generating a graphics signal for display, said graphics signal representing a graphics image;

video processing means for producing a processed video signal at an output; and

picture-in-picture processing means for receiving first and second video signals and for producing a combined video signal comprising a main image portion and a secondary image portion at an output and coupling said combined video signal to said video processing means;

said picture-in-picture processing means deriving a secondary image signal from one of said first and second video signals for use as said secondary image portion;

said video processing means being coupled to said picture-in-picture processing means for receiving said secondary image signal and to said graphics generation means for receiving said graphics signal and producing a combined signal which when displayed comprises a video image completely surrounded by said graphics image;

wherein said graphics image includes graphical representations of functions to be controlled, said functions being selected for control by a user; and

at least one of said functions affects the display of said processed video signal.

2. Menu generation apparatus for use in a television receiver, comprising:

graphics generation means for generating a graphics signal for display, said graphics signal representing a graphics image;

video processing means for producing a processed video signal at an output;

said video processing means including switch means having a first input coupled to receive a video signal and a second input coupled to receive said graphics signal, said switch means coupling one of said signals at said inputs to an output;

picture-in-picture processing means for receiving first and second video signals, said picture-in-picture processing means producing a combined video signal comprising a main image portion and a secondary image portion, said picture in picture processing means having an output coupled to said video processing means for applying said combined video signal thereto; and

a controller for controlling said switch means and said picture-in-picture processing means;

said controller operating in a first mode for causing said picture-in-picture processing means to select said first video signal for use as said main image portion and said secondary image portion is derived from said second video signal; and

said controller operating in a second mode for causing said switch means of said video processing means to select said graphics signal for use as said main image portion and said secondary image portion is derived from one of said first and second video signals;

said graphics image including graphical representations of functions to be controlled, said functions being selected for control by a user, at least one of said functions affecting the display of said processed video signal; and

said controller operating in a third mode for causing said switch means of said video processor to select said graphics image only, said graphics image including a depiction of a screen of a television receiver, and said graphics generation means generates animated graphics for display on said screen of said depiction of said television receiver.

3. Menu generation apparatus for use in a television receiver, comprising:

graphics generation means for generating a graphics signal for display, said graphics signal representing a graphics image;

picture-in-picture processing means having inputs coupled to receive first and second video signals for producing a combined video signal comprising a main image portion and a secondary image portion;

video processing means for producing a processed video signal at an output; and

said video processing means including fast switch means having a first input coupled to receive said combined video signal and a second input coupled to receive said graphics signal, said fast switch means coupling one of said signals at said inputs to an output; and

a controller for controlling said switch means and said picture-in-picture processing means;

said controller operating in a first mode for causing said switch means of said video processing means to select said first video signal for use as said main image portion and said secondary image portion is derived from said second video signal; and

said controller operating in a second mode for causing said switch means of said video processing means to select said graphics signal for use as said main image portion and said secondary image portion is derived from one of said first and second video signals;

said picture-in-picture processing means generating said combined video signal for displaying said secondary image portion in a first screen position in said first mode, and in a second different screen position in said second mode;

said graphics image displayed in accordance with said graphics signal including graphical representations of functions to be controlled, said functions being selectable for control by a user; and

at least one of said functions affecting the display of said processed video signal.

4. Menu generation apparatus for use in a television receiver, comprising:

graphics generation means for generating a graphics signal for display, said graphics signal representing a graphics image;

video processing means for producing a processed video signal at an output; and;

said video processing means including switch means having a first input coupled to receive a video input signal and a second input coupled to receive said graphics signal for coupling one of said signals at said inputs to said output;

said graphics signal representing said graphics image comprising a main image portion and a secondary image portion, said main image portion being substantially static and said secondary image portion being dynamic; and

a controller for controlling said graphics generation means and said switch means;

said graphics image including graphical representations of functions to be controlled, said functions being selected for control by a user; and

at least one of said functions affecting the display of said processed video signal.

* * * * *

US005751953A

United States Patent [19]

Shiels et al.

[11] Patent Number: 5,751,953

[45] Date of Patent: May 12, 1998

[54] **INTERACTIVE ENTERTAINMENT PERSONALISATION**

[75] Inventors: **Martin A. Shiels**, Bristol; **Richard S. Cole**, Redhill; **Paul J. Rankin**, Horley; **Rosa Freitag**, London, all of England

[73] Assignee: **U.S. Philips Corporation**, New York, N.Y.

[21] Appl. No.: **705,887**

[22] Filed: **Aug. 29, 1996**

[30] **Foreign Application Priority Data**

Aug. 31, 1995 [GB] United Kingdom 9517808

[51] **Int. Cl.**[6] **G06F 17/00**

[52] **U.S. Cl.** **395/200.09**

[58] **Field of Search** ..... 364/514 A, 514 R; 348/13, 16; 455/5.1; 463/30, 31; 273/429, 430; 395/200.09, 173

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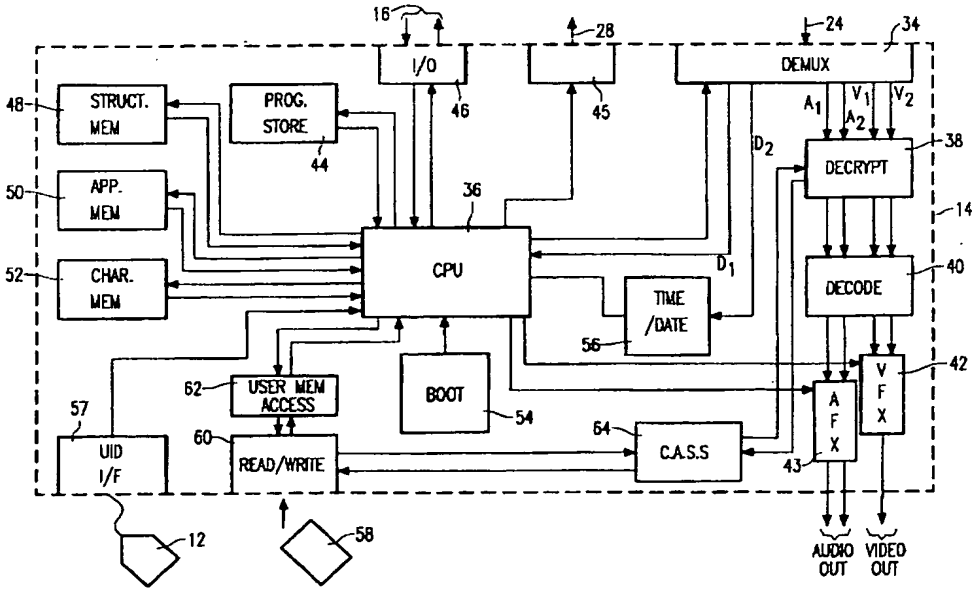
Primary Examiner—Ellis B. Ramirez

Attorney, Agent, or Firm—Debra K. Stephens

[57] **ABSTRACT**

A method and apparatus are provided for enabling user interaction with a branch-structured narrative entertainment (**90**) in which branch path selection (A,B,C) is made at least partially in response to user input. A user is provided with a non-volatile memory, such as a smart card, in which memory is stored data specifying a record of past user interactions. This data is periodically checked and updated by the apparatus and, at one or more branch points (**92**) of the narrative, access to one or more branch paths (A,B,C) is enabled or denied on the basis of the stored user history.

10 Claims, 4 Drawing Sheets



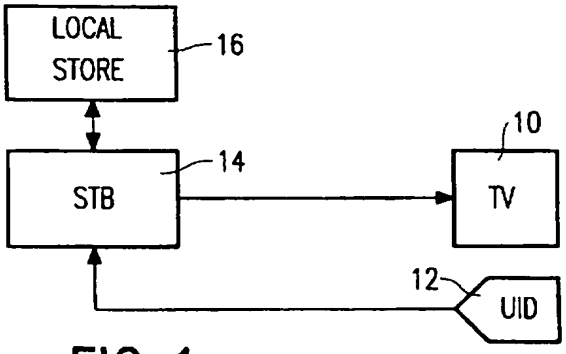


FIG. 1

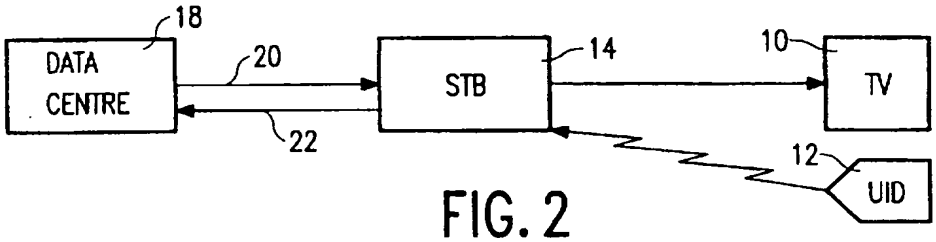


FIG. 2

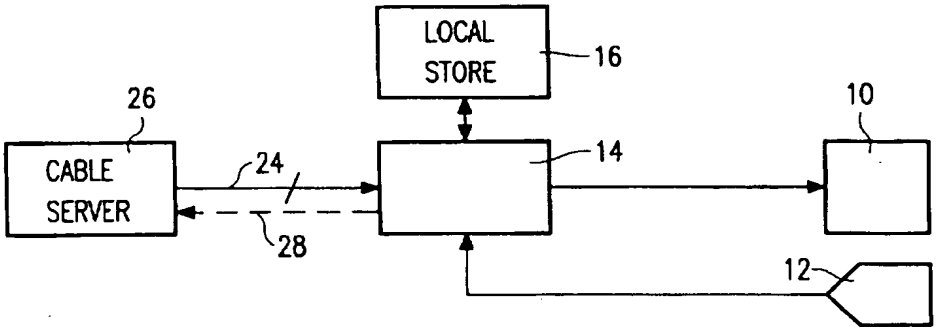


FIG. 3

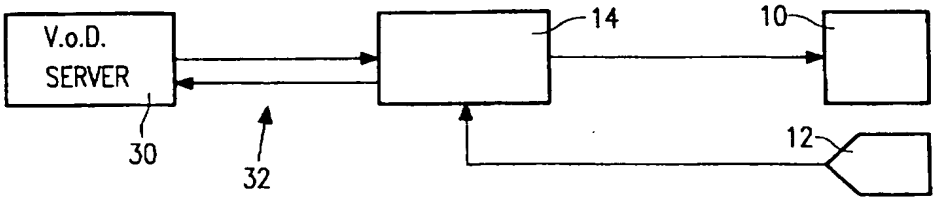


FIG. 4

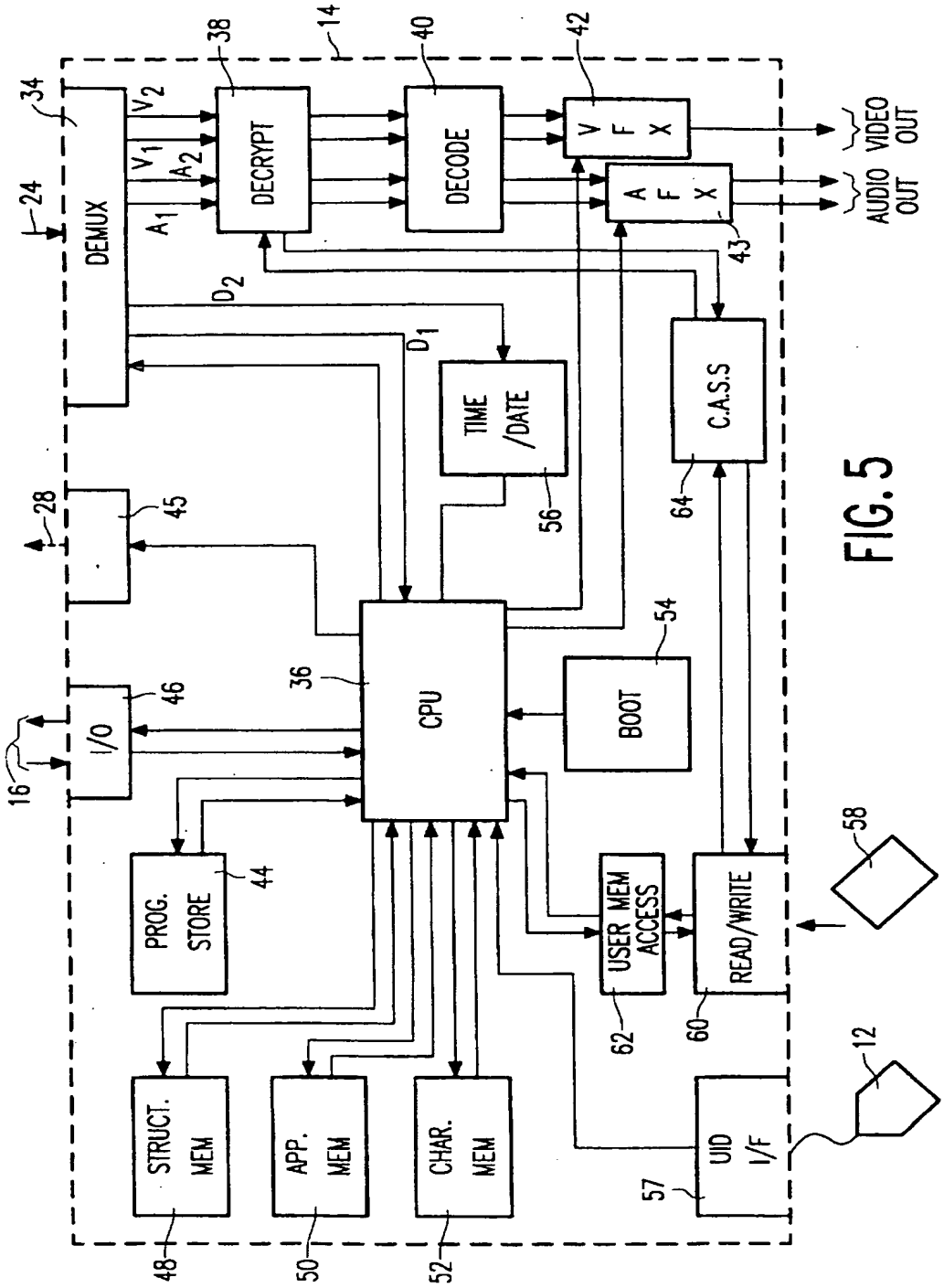

14
38
40
42
34
24
DEMUX
V2
V1
A2
A1
DECRYPT
DECODE
V F X
A F X
VIDEO OUT
AUDIO OUT
43
D2
D1
TIME /DATE
C.A.S.S
56
64
28
45
36
CPU
54
BOOT
46
I/O
16
PROG. STORE
44
USER MEM ACCESS
READ/WRITE
58
62
60
12
STRUCT. MEM
APP. MEM
CHAR. MEM
UID I/F
57
48
50
52

FIG. 5

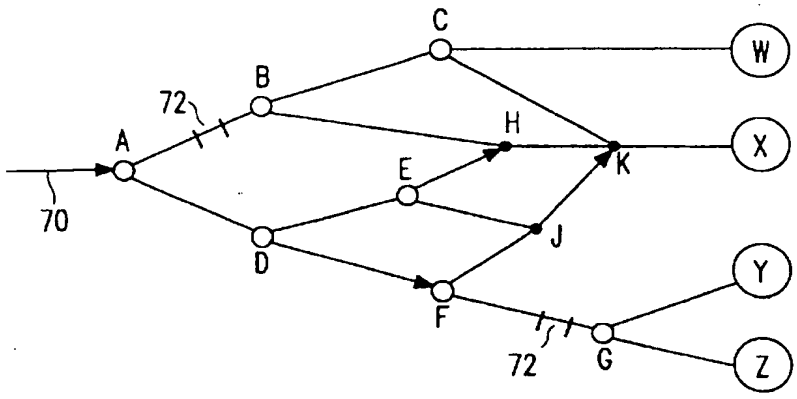


FIG. 6

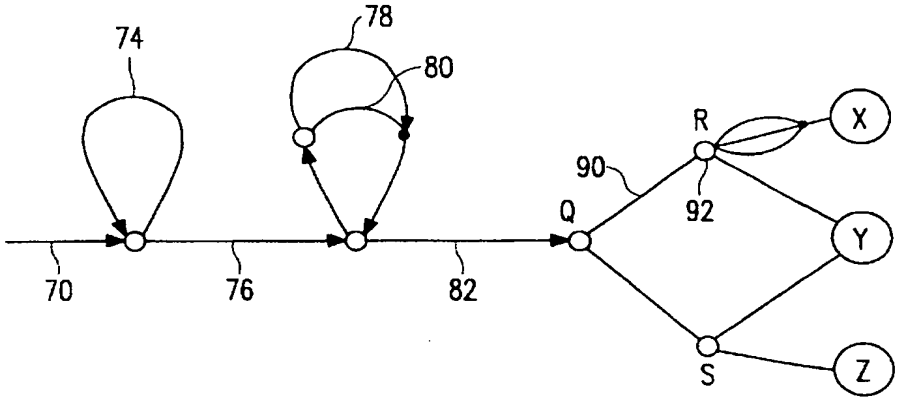


FIG. 7

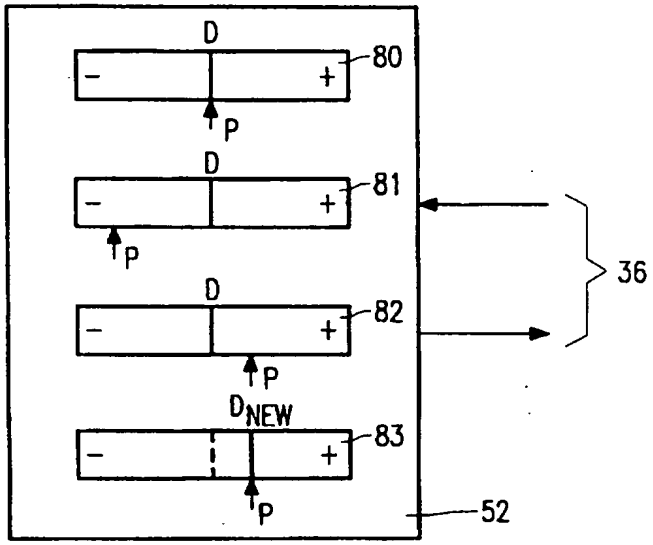

D
80
P
D
81
P
36
D
82
P
D NEW
83
P
52

FIG. 8

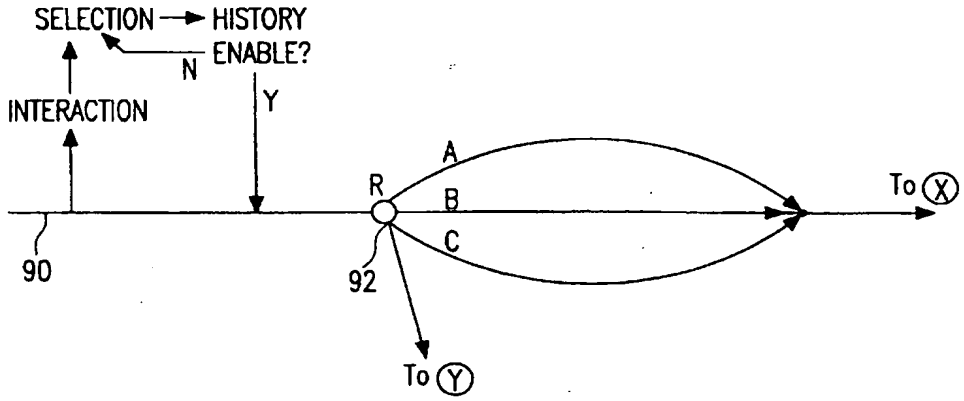

SELECTION
HISTORY
ENABLE?
N
Y
INTERACTION
A
R
B
C
To X
90
92
To Y

FIG. 9

INTERACTIVE ENTERTAINMENT PERSONALISATION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to interactive entertainment systems and, in particular, to such systems in which the user is able to control, directly or indirectly, the path of a narrative or plot line.

2. Description of the Related Prior Art

An example of such a system is described in U.S. Pat. No. 4,305,131 to Robert M. Best, and comprises a motion picture system in which the viewer is treated as a character in the narrative. At branch points in the narrative, a character on screen will ask a question of the viewer: the viewer is provided with a hand held menu screen on which two or more command words appear, which words are amongst the limited vocabulary of a speech recognition unit of the system. The branch taken by the narrative will depend on how the viewer responds to the on-screen characters question, that is to say which of the command words is spoken by the viewer. The multiple story lines are held on optical disc as independently addressable video frames, blocks of compressed audio and/or cartoon graphics.

In order to further enhance the user's feeling of being a part of the narrative, Best proposes inserting recordings of the user's name into the dialogue accompanying the narrative, such that the actors within the narrative speak to the user using the user's own name. Despite these extra "personalising" features, the Best system is still somewhat limited in that, for each branch point of the narrative, the requests for user input follow the same general form.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an interactive entertainment which is self modifying through the course of the narrative in response to user input, such as to provide a "reward" for or to the user.

In accordance with the present invention there is provided an interactive entertainment apparatus operable to output sequences of image frames comprising a user-influenced path through a branch structured narrative, the apparatus comprising: a source of image frame data for all branch structure paths of the narrative; branch storage means for data defining the narrative branch structure; user operable input means; branch selection means coupled to the branch store and operable to determine when the narrative reaches a branch point and to call one of two or more image frame sequences from the image frame source in dependence on the user input; and an output for the selected image frame sequences; characterised in that the apparatus further comprises a user memory and the branch selection means is arranged to record therein data specifying two or more past user inputs, and to refuse or enable access to at least one path from a branch path in dependence on the stored past input data.

The contents of the paths to which the user may granted or denied access may, for example, contain scenes in which one or more characters of the narrative address the user in familiar terms. In other words, if the user has not "met" (interacted with) the character previously the narrative could appear disjointed if access was granted to narrative scenes requiring the user to have previously encountered the character.

The types of user input may be divided into two or more classes, with the branch selection means being operable to determine, for each instance of interaction, the class into which the user input falls, with separate stores being maintained of user input data within the user memory for each class. This would allow, for example, the maintenance of separate user interaction histories for different characters within the narrative.

The user memory is suitably a non-volatile device, such as a smart card, such that, where the interactive narrative is of an episodic nature (such as a soap opera), the history of user interactions with the various characters may be maintained from episode to episode. The stored history of user interactions may suitably be in the form of a cumulative value, although the store preferably maintains an identifier as to each particular interaction such that the oldest stored data may be periodically deleted, with only a finite number of past interactions being recorded. The cumulative selection value may suitably be used by the branch selection means as the basis for enabling/disabling access to a branch point path in dependence on its value relative to a given threshold for that branch point.

Also in accordance with the present invention, there is provided a method for control of an interactive entertainment apparatus, as defined in the attached claims to which reference should now be made.

BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages of the present invention will become apparent from reading of the following description of preferred embodiments of the present invention, given by way of example only, and with reference to the accompanying drawings in which:

FIGS. **1** to **4** show differing combinations of material source supplying a user interface apparatus embodying the present invention;

FIG. **5** is a schematic representation showing the user interface apparatus of FIG. **3** greater detail;

FIGS. **6** and **7** illustrate differing arrangements of interactive narrative structure;

FIG. **8** schematically represents the operation of the user memory of FIG. **5**; and

FIG. **9** represents a segment of the narrative structure of FIG. **7**, including a history dependent branch point.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following, we concentrate particularly on the case where the image frames accompanying the narrative are video frames, although as will be recognised (and as will be described), the present invention is equally applicable to sequences of animated image frames, and compound image frames composed of overlying portions of animation and video.

FIGS. **1** to **4** represent a number of different ways by which an interactive narrative may be supplied to a user. In each case, the user views the received narrative on a monitor screen **10**, suitably a television set, and is provided with an input device (UID) **12** for inputting commands, responses or other data as required by the particular application. In addition, the user is provided with an interface in the form of a set top box (STB) **14** to which the narrative source or sources are coupled, to which the user commands are input, and from which the television receives the signal for display. The user input device **12** has a few simple controls as

required by the application, for example three select buttons and up/down/left/right shift controls or a joystick, and may be hard wired to the STB as shown in FIG. 1, or connected by infrared (IR) link in known manner as in FIG. 2.

In the embodiment of FIG. 1, the narrative video and structure together with subsidiary information is supplied wholly from a local data source **16**, such as a compact disc player or CD-ROM. In the embodiment of FIG. 2, the narrative video, structure and other information is supplied wholly from a remote source **18** via a data network **20**, with user commands being sent to the remote source via a return path **22** of the network. In the embodiment of FIG. 3, the narrative video and other information is supplied as multiplexed channels on a single line **24** from a remote source **26**, such as a cable television network server and is supplemented by information such as the structure from the local data source **16**. In order to avoid the need for mass memory at the user site a return line **28** may be provided to give the user site at least partial control over the information sent out. In the embodiment of FIG. 4, the narrative is supplied via a Video on Demand (VoD) system from a server **30** over a network **32**, access to which may require the user to enter an identification code or insert a smart card or similar into an appropriate card reader to enable decryption of encrypted signals. As will be described, rather than providing separate units for decryption and card reading, these functions may be provided within the STB.

FIG. 5 shows the internal structure of the STB **14** when set up for the configuration of FIG. 3, that is to say with input from both remote source **26** via network **24** and local source **16**. The incoming signal from the network **24** contains a number of independent service components (audio, video and data streams) multiplexed together. In this example, the signal contains two data streams D_1 and D_2 the functions of which are explained below, together with two audio streams A_1 and A_2 (for example left and right channels of a stereo audio signal) and two video frame streams V_1 and V_2. The multiplexed signal is received by a demultiplexer **34** which splits it into the separate components under control of a processor **36**. Before being output from the STB the audio and video may pass through decryption **38** and decoding **40** stages, the video signals may be processed **42** to provide video effects such as picture-in-picture (PIP), and the audio may also be treated **43**, as will be described below.

The first of the data streams D_1 is input to the processor **36** and contains program information specifying how the processor is to handle the audio and video streams and other information specific to features of the particular interactive narrative. This program information is held by the processor in program store **44**. A specification for the branch structure of the narrative may be downloaded via D_1 (in response to a processor call on the network return path **28**, via interface **45**) or it may be read from local storage **16** via interface **46**, with the processor sending track addressing and play commands as required. The branch structure is stored in structure memory **48**, with further memories being provided for application features **50** and character features **52**, as may be required by particular forms of narrative entertainment. Whilst shown in the Figure as separate stores, it will be readily appreciated that the program store **44** and the structure, application and character memories, **48**, **50**, **52** may be provided as respective areas of a single memory, provided that the more detailed addressing and associated access times for the larger memory do not unduly affect performance.

On powering up of the STB **14**, a bootstrap loader **54** initialises the processor and instructs it to call for the branch structure and program information from the appropriate sources. Alternatively, and more simply, the bootstrap loader **54** may just initiate the calling up of the program information, with the first instruction of that program information being for the processor **36** to call up the branch structure and store it in program store **44**.

Some narrative applications may require information as to the current date and time of day and, to avoid the need for the STB to maintain an accurate, non-volatile, clock source, a time/data store **56** is provided, with the timing information being updated at regular intervals from the remote source using data component stream D_2 as shown. For the FIG. 1 embodiment, where there is no remote source, the data/time information might be obtainable from the local source if that maintained its own clock.

Signals from the user input device (UID) **12** are received by the STB at UID interface **57** and, from there passed to the processor **36**. If, as in FIG. 2, the UID **12** is coupled to the STB via infra-red link, the interface **56** would include a suitable infra-red receiver.

Some forms of narrative entertainment may be sporadic or episodic with the equipment being switched off in between sessions. To avoid the user being forced to re-start from scratch each time the equipment is switched on, a non-volatile user memory is provided in which features such as a history of the users interactions (as will be described), the user's current position within a narrative, user preferred system settings etc are stored. The user memory may suitably be held on a removable storage device such as a smart card **58** with the STB having a suitable card reader **60** with access to that area of the card storing the user memory being made via user access control **62**: user memory access control **62** may, alternatively, be a purely software route executed within processor **36**.

In some circumstances, the interactive entertainment may be provided by a remote server on a "pay-per-play" basis with the audio and video signals being transmitted in encrypted form and requiring particular key codes to enable them to be decrypted. In such a situation, the smart card **58** providing the non-volatile user memory may have a further function as a part of the decryption system. In such a case, the smart card **58** would carry a series of the codes, one or more of which would be required by decrypter **38** to decrypt the audio and video signals. Data stream D_1 would contain an identifier for one or more of the codes which identifier would be passed to a conditional access sub-system (CASS) **64**, which in turn would use the identifier to address the stored codes on the smart card (via card reader **60**) and, having obtained the necessary code or codes from the smart card, the CASS **64** would forward the obtained codes to the decrypter **38**.

Where the video and/or audio signals are transmitted in compressed form, for example discrete cosine transform coded video according to MPEG standards, the decoder **40** may be provided. A switchable by-pass to the decoder (not shown) may be provided for the case where the display (television) is already equipped with, and set up for, decoding of the standard.

The video effects stage **42** is operated under control of the processor **36** to provide those features of the displayed image which are locally generated under the direction of the application program and/or user input, rather than being present in the video data supplied from the remote or local source. Such features may include menu bars, user movable cursors, system messages and so forth. As previously mentioned, one of the possible video effects is picture-in-

picture (PIP) where the in-screen picture may be used to provide supplementary or future historical information about the narrative to the user. In one possible arrangement, video data streams V_1 and V_2 may synchronously show a particular scene of the narrative being played out, but with each being presented through the "eyes" of a different character within the scene.

Where the narrative is composed of animated (rather than video) images, the effects stage **42** may handle the rendering of the images, with the remote source supplying the source and instruction data. Whilst this would require a significant increase in processing power for the STB, the user interaction could then include modification of the images themselves in addition to directing narrative branch point selection. The effects stage may also handle the compilation and mixing of compound images, for example applying remotely-supplied video sprites to a locally-generated graphical background.

The audio effects stage **43** may be used for processing of the received audio signals A_1,A_2 in order to generate effects such as echo, without requiring supply and/or storage of multiple versions of an audio segment. The stage may also be used for local generation of some sound effects, suitably those required as immediate response to a user input, with basic waveform data, call commands and so forth being downloaded to the application memory **50** at the start of a session or on initialisation.

Different arrangements of narrative structure may be supported by the STB of FIG. **5**, making use of various of the facilities it provides, as required by the particular form of the narrative. FIG. **6** shows a branched narrative structure starting with a common introductory portion **70**, which would serve to set the scene for the narrative, introduce the viewer to the characters and so forth. At branch nodes A to G a decision is required as to which path the narrative will take, with the user navigating through the network of possible story lines to reach one of the four possible endings W to Z. In order to avoid an "explosion" of possible endings, which would require a large amount of video data to be available for a relatively short narrative, some paths combine (at nodes H, J and K) such that some sections of the narrative (for example H to K) may appear within the narrative regardless of which path is chosen at node A for example. In order to maintain the user's "immersion" in the narrative story line it is important that, at both branching and combining nodes there is no discernable break in the video stream. Detailed techniques for seamless joining of video sequences are described in, for example, our copending United Kingdom patent applications 9424429, 9424436 and 9424437 (our references: PHB 33952, PHB 33950 and PHB 33951). A principal requirement for seamless joining is that the system has sufficient time to call up the selected next video segment and synchronise its start to the end of the present sequence. To enable this, a finite period prior to the end of the present video sequence is provided, for example as shown at **72** in FIG. **6**, during which period the user may interact via UID **12** (FIG. **1**). The location of the interaction periods **72** relative to the narrative is a feature of the structure, and is held in structure memory **48** of the STB (FIG. **5**).

The existence of an interaction period may be indicated to the viewer in a number of different ways. For example, a menu of possible options may be displayed on the screen: this menu is preferably provided via the video effects unit **42** of the STB such that, as soon as the user has selected an item, the menu may be removed from the screen to minimise the intrusion. The positioning of the menu should be such as to avoid blocking the on-screen story and may be provided as, for example, a picture-in-picture or as a pull-up menu which the user can access during an interaction period.

Each branch node of the narrative is preferably provided with a default setting such that, if there is no user input during the interaction period **72**, then the narrative will continue along the default path without stalling for lack of instruction.

The audio accompaniment to the video sequences of FIG. **6** is not tied to the video itself but instead is called up as a feature of the narrative structure. This enables sections of the audio (such as dramatic or background music) to be re-used during the course of the narrative, for example to provide an audio cue instead of, or in addition to, a visual cue indicating that interaction may take place or is now required. As mentioned, some of this audio may be generated locally.

An alternative arrangement for the branch structure is shown in FIG. **7**. As before, the narrative starts with a common introductory portion **70** leading to a first branch node L. Instead of a diverging branch output, branch node L provides access to a narrative loop **74** which returns to node L at its end, following which the narrative continues along path **76** to another branch node M. The narrative loop **74** may be used to enable the viewer to access background or subsidiary information to the narrative: the default setting for node L would be to continue with narrative section **76**. At node M, a further narrative loop is provided having within that loop a further branch node N and recombining node P linked by two possible loop narrative paths **78** and **80**. Multiple loop nestings, as well as loops within loops may be provided. As shown, the narrative loop structure may be combined with a diverging branch structure, with diverting branch node Q following narrative section **82** and further branch nodes R and S leading to conclusion of the narrative at one of three possible ending X, Y or Z.

In order to "reward" a user for past interactions, path selection at some of the narrative branch points is made dependent on the users previous interactive. Figure **8** schematically represents how the user memory (on smart card **58**, FIG. **5**) is arranged to provide the historical information. A number of sliding scales **80** to **83** are provided, each having a pointer to a current value P and a central default value D. On initialisation of the system, at the user's first play, each of these scales is given a first value and is assigned to a respective character or feature of the narrative. From initial settings at the default value D (or possibly a user-selected start point) the pointers will be moved up or down the scale as the user takes part in interactions related to that character. Using a part of the narrative structure of FIG. **7**, expanded in FIG. **9**, as an example, the user "values" associated with a character appearing in each branch of the narrative prior to branch node R may be as follows:

Path	Value
70	+1
74	−4
76	+2
78	−2
80	+2
82	−1
90	0

The decision at branch node R may then be set such that, if the users accumulated total (the pointer position) is greater than or equal to +4 then access to path A is permitted, and an accumulated total of −4 or lower would enable access to

path C. whilst any value between +3 and −3 would result in automatic selection of default path B.

In addition to the narrative sequence character values altering the stored user values. the branch nodes themselves may have an effect on the stored values. for example incrementing. decrementing or resetting to the default values. Also. the default values themselves may be movable with. for example. consistent or extreme pointer positioning on one side of the default leading to gradual movement of the default towards that side. as shown for scale **83** in FIG. **8**.

Rather than wholly automatic selection on the basis of accumulated user totals. this feature may instead be used to selectively lock or unlock certain paths of a narrative. The decision at branch node Q would then be available to the user only if they had accumulated sufficient user values earlier in the entertainment. and the "unlocked" branch might contain scenes where the character appears to address the user in a familiar manner, or scenes of personal revelations from characters. In situations where insufficient user values have been accumulated. the system may react to user-directed selection is of a locked branch with a displayed and/or audio message (generated through video and/or audio effects stage **42.43**) such as "Path Closed" to alert the user to the need to take different pathways on the next play of the entertainment. Alternatively. where only one unlocked path is available from a node. the visual and/or audio cues to the user to interact may suitably be suppressed and the unlocked path automatically selected as a default, such that the chance to interact may come as a surprise to the user on a subsequent playing.

Where the entertainment is episodic. the user is provided with a chance to save user memory settings or erase them at the end of each episode. By storing the memory settings. the user reward for interaction may be carried from one episode to the next.

From reading the present disclosure. other modifications and variations will be apparent to persons skilled in the art. Such modifications and variations may involve other features which are already known in the art and which may be used instead of or in addition to features already described herein. For example. some of those features described in relation to the STB (**14**, FIGS. **1** to **5**) may instead be provided within a personal computer and others within a television or display unit. The reference to an apparatus in the following claims will be readily understood to cover all arrangements where the various recited features operate together in the manner described. regardless of whether those features are provided in a single unit or distributed amongst a number of interconnected units.

Although claims have been formulated in this application to particular combinations of features. it should be understood that the scope of the disclosure of the present application also includes any novel feature or combination of features disclosed herein either explicitly or implicitly. whether or not relating to the same invention as presently claimed in any claim and whether or not it mitigates any or all of the same technical problems as does the presently claimed invention. The applicants hereby give notice that new claims may be formulated to such features and/or combinations of such features during prosecution of the present application or of any further application derived therefrom.

What is claimed is:

1. Interactive entertainment apparatus operable to output sequences of image frames comprising a user-influenced path through a branch structured narrative. the apparatus comprising:

a source of image frame data for all branch structure paths of the narrative;

branch storage means for data defining the narrative branch structure;

user operable input means;

branch selection means coupled to the branch storage means and operable to determine when the narrative reaches a branch point and to call one of two or more image frame sequences from the image frame source in dependence on the user input;

an output for the selected image frame sequences; and

a user memory,

the branch selection means being arranged to record therein data specifying two or more past user inputs, and to refuse or enable access to at least one path from a branch path in dependence on the stored past input data.

2. Apparatus as claimed in claim **1**, wherein user inputs are divided into two or more classes, and the branch selection means is operable to determine, for each interaction, the class into which the user input falls and to maintain separate stores of user input data in the user memory for each class.

3. Apparatus as claimed in claim **1**, wherein data specifying a finite number of past user inputs is stored in the user memory, with the branch selection means being arranged to delete the oldest stored data when this finite number is reached.

4. Apparatus as claimed in claim **1**, wherein the user memory is a non-volatile device.

5. Apparatus as claimed in claim **4**, wherein the user memory is held on a removable card, with the apparatus further comprising means for receiving, reading from, and writing to the card.

6. Apparatus as claimed in claim **1**, wherein each user input is assigned a numerical value, and the branch selection means generates and maintains a selection value derived from past user input values, and the branch selection means enables or refuses access to said at least one path in dependence on the current selection value relative to a threshold value for the branch point.

7. A method for control of an interactive entertainment apparatus, where the apparatus presents to the user a branch structured narrative, and user input determines which path is followed at at least one narrative branch point. characterised in that a history is maintained of a user's interactions and branch path selection at at least one narrative branch point is enabled or disabled on the basis of the user history.

8. A method as claimed in claim **7**, wherein enabling of a branch path selection automatically triggers selection of that branch path.

9. A method as claimed in claim **7**, wherein the interactive entertainment is episodic and the apparatus is inactive between episodes, with the user interaction history being maintained and carried over successive episodes.

10. A method as claimed in claim **7**, wherein at least a part of the history is deleted at predetermined intervals.

* * * * *

XIV. APPENDIX E - RELATED CASES APPENDIX

NONE